SITE ASSESSMENT REPORT
FOR
JACKSON DROP FORGE
JACKSON, JACKSON COUNTY, MICHIGAN
TDD # T05-9310-011
PAN # EMI1352SAA
DOCUMENT CONTROL NUMBER TAT-05-25-03038

December 11, 1993

Prepared For:
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U.S. EPA Region V

Contract No.: 68-WO-0037

Project Manager: Edward L. Lancaster Date: 12/11/93
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TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

APPENDICES

Appendix

1.0 INTRODUCTION

On October 13, 1993, the United States Environmental Protection Agency (U.S. EPA) tasked the Ecology and Environment, Inc., Technical Assistance Team (TAT) to prepare and implement a Health and Safety Plan; compile available information; conduct a site inspection; conduct air monitoring as appropriate; prepare and implement a sampling plan if requested by the On-Scene Coordinator (OSC); evaluate threat to human health and the environment; document on-site activities; provide photo documentation; and assist with preparation of information for an Action Memo under Technical Directive Document (TDD) Number T05-9310-011. The TAT members (TATMs) performing the site assessment were Michael Dieckhaus, Edward Lancaster, Peter Liu, and Nazeer Uddin.

2.0 BACKGROUND

2.1 Site Description

The Jackson Drop Forge site includes an abandoned steel forgings facility located at 2001 Wellworth Avenue and the flood plain of the Grand River across the street and north of the facility, in Jackson, Jackson County, Michigan (Figure 1). The facility at 2001 Wellworth Avenue is bordered on the south by railroad tracks, on the west by vacant property, on the north by Wellworth Avenue, and on the east by residential property. The flood plain is bordered on the north by the Grand River, on the east by a forested flood plain, on the south by residential and vacant property along Wellworth Avenue, and on the west by light industrial property (Figure 2).

2.2 Site History

The Jackson Drop Forge facility (JDF) operated for over 40 years as a steel forge producing steel components for a wide range of industries, which included oil and gas exploration, automotive, and rail car. The facility and additional property, north of Wellworth Avenue, was owned by Jackson Drop Forge Company from the 1950s until the company filed for bankruptcy in 1987. Jackson Innova Corporation purchased the property and facility from the City of Jackson in a foreclosure sale and operated at the site until 1990, when JDF closed.

On April 12, 1991, the Michigan Department of Natural Resources (MDNR) received a complaint from an anonymous caller that there were 3,000 drums located on the banks of the Grand River near the JDF site. Representatives of MDNR confirmed there were several hundred 55-gallon, 5-gallon, and 1-gallon containers at the site. The containers were in varying stages of deterioration; a large number of the containers had leaked their contents into the

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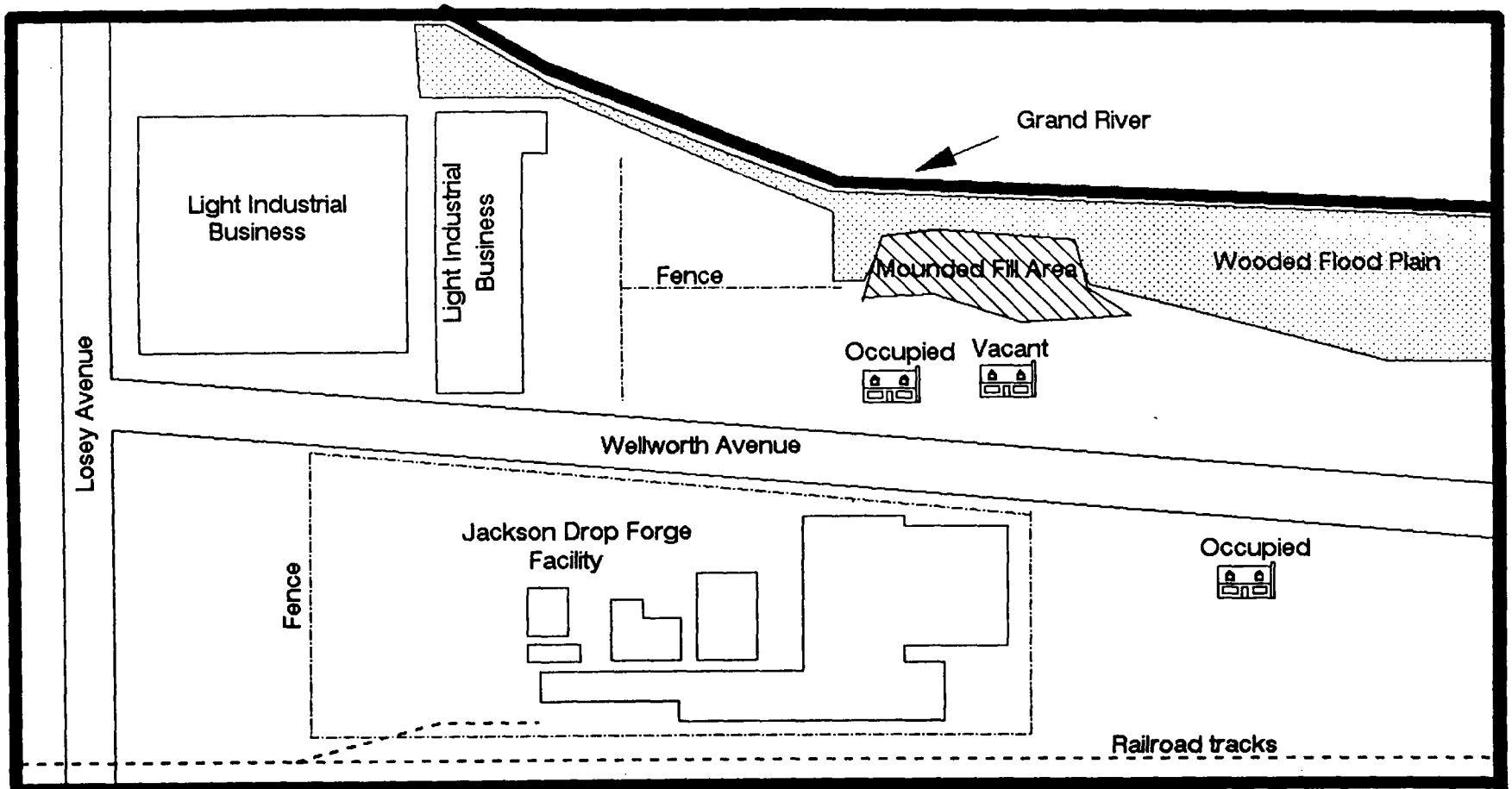
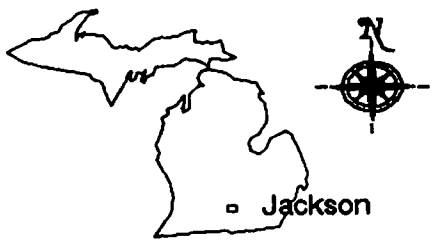
TITLE: Site Location Map		FIGURE #: 1
SITE: Jackson Drop Forge		SCALE: 1:24,000
CITY: Jackson	STATE: Michigan	TDD #: T05-9310-011

SOURCE/DATE
USGS 7.5 MINUTE SERIES QUADRANGLES
JACKSON SOUTH, MICHIGAN (1971 PR 1976)





Date: November 9, 1993

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Region V

TITLE: Site Map		FIGURE #: 2
SITE: Jackson Drop Forge		SCALE: Not to Scale
CITY: Jackson	STATE: Michigan	TDD #: T05-9310-011

surrounding environment. The MDNR representatives interviewed the residents of 2050 Wellworth Avenue, directly south of the dumping area. According to one resident, the drums were filled with a rubber sealant used to seal joints in highway concrete sections, and he indicated to MDNR that he had previously worked for the manufacturer of the sealant in Michigan City, Michigan.

In April 1993, the MDNR contacted the current owners of the affected property, Jackson Innova Corporation, concerning the complaint of improper disposal of barrels and containers of waste on JDF property across Wellworth Avenue from the JDF facility. MDNR also informed the owners of their plan to collect four samples of waste from the containers. The MDNR returned to the site in July 1993, to collect four waste samples from on-site containers for analysis. Based on analytical results of the four samples, the MDNR notified Jackson Innova Corporation, in August 1993, that waste containers on-site had high levels of benzene, toluene, ethylbenzene, and xylene (BTEX), and Jackson Innova Corporation was required to conduct removal and remedial actions at the site. On October 13, 1993, the MDNR verbally requested assistance from the U.S. EPA in conducting a site assessment of the JDF property.

3.0 SITE ACTIVITIES

On October 18, 1993, U.S. EPA On-Scene Coordinators (OSCs) Ralph Dollhopf and Jason El-Zein and TATMs Dieckhaus and Lancaster conducted a preliminary investigation of the site with MDNR representatives Peter Masson and Dowe Parsons. During the investigation, U.S. EPA and TAT observed and documented the improper disposal of several thousand 55-gallon steel drums, 5-gallon steel containers, and 1-gallon steel cans. Most of the containers, located in the flood plain of the Grand River, had holes, were missing lids, or were in deteriorated condition. Many drums were standing in shallow water of the flood plain of the Grand River. Many of the containers contained sludges, adhesives, coatings, and grayish-white granular material. The U.S. EPA and TAT also observed suspicious mounded areas indicating buried waste or containers in the area north of Wellworth Avenue. Prior to departing the site, the OSCs requested TAT to mark drums and other prospective sampling areas for a future sampling event. While the TATMs were marking drums, a nearby resident of Wellworth Avenue approached the TAT and alleged that most of the drums came from the JDF facility and that the owners of the facility had illegally dumped the drums onto his property and the surrounding flood plain.

On October 25, 1993, TATMs Lancaster, Uddin and Liu returned to the site to collect waste and soil samples from the containers in the flood plain and the JDF facility. Air monitoring was conducted using a Microtip photoionization detector (PID). The background reading was 2.2 units. The TAT collected eight

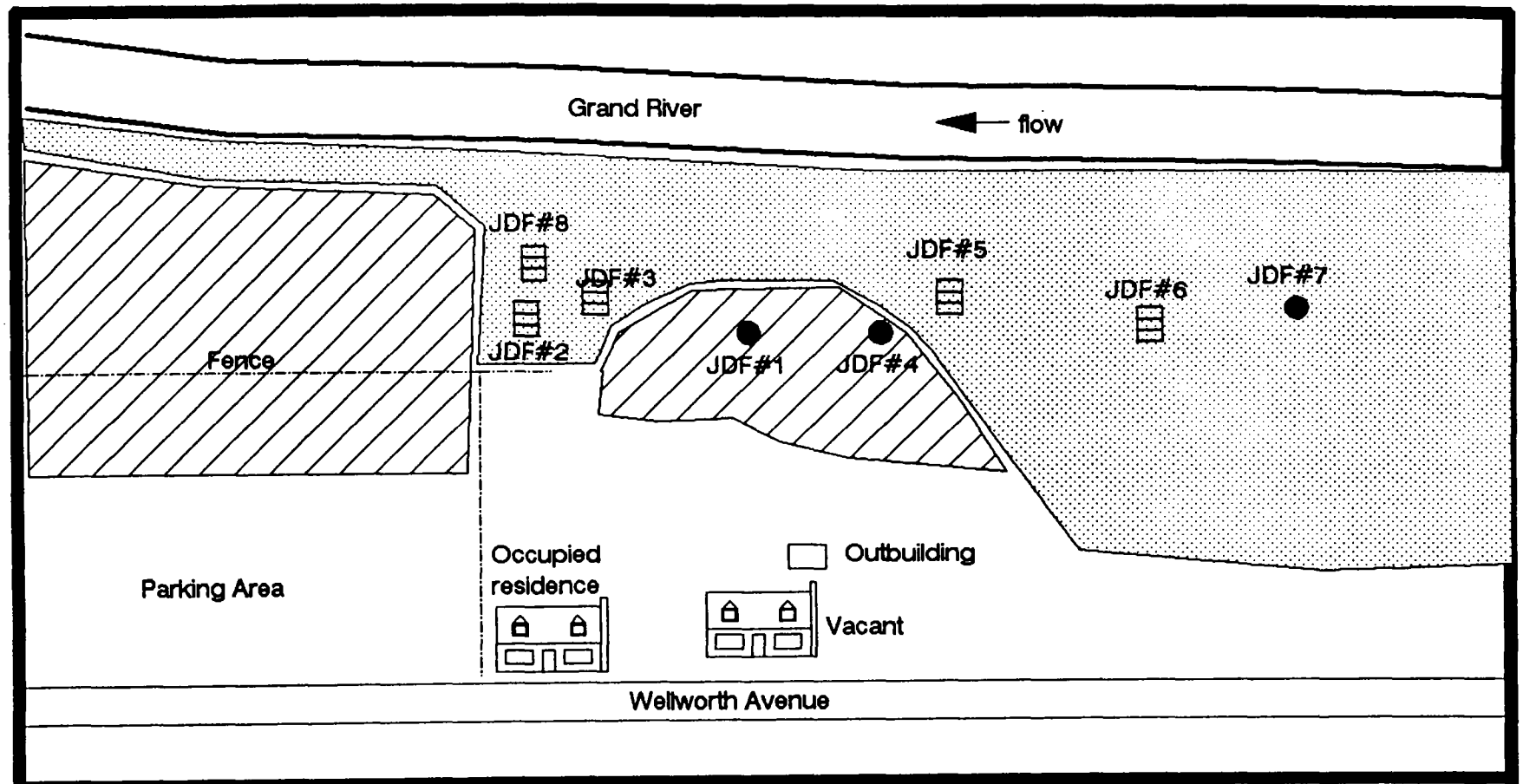
samples that included three soil samples (JDF#'s 1, 4 and 7), and five waste samples (JDF#'s 2, 3, 5, 6, and 8) from the soil surface and containers in the flood plain area (Figure 3). An additional four samples (JDF#'s 9, 10, 11, and 12) were collected from containers located within the facility (Figure 4).

Sample JDF# 1 was a surface soil sample collected from near the center of the mounded suspected fill area south of the flood plain. Air monitoring of the soil's headspace was at background levels. JDF# 2 was a black, tar-like, sludge sample collected from a 55-gallon steel drum. The PID recorded 345 units from the sludge. Sample JDF# 3 was a black, sticky material found on the top of a 55-gallon steel drum. JDF# 4 was collected from a pile of grease located on the soil suface at the eastern edge of the mounded fill area. JDF# 5 was a white powder collected from a 55-gallon steel drum whose bottom was partially rusted out. Air monitoring of the headspace of the 55-gallon steel drum from which sample JDF# 6 was collected recorded 502 units on the PID. The sample, JDF# 6, was a blue-gray solid. Another surface soil sample, JDF# 7, was collected from near the eastern edge of the drum disposal area in the flood plain. JDF# 8 was a gray solid collected from a one gallon paint can, located directly north of the house at 2050 Wellworth Avenue.

Sample JDF# 9 was collected from a drum in the southwest corner of the JDF facility property. The PID registered 160 units from the headspace of the drum from which sample JDF# 9 was collected. A small plating vat containing a brown liquid was the source of sample JDF# 10. Sample JDF# 11 was an oily liquid collected from a drum on the south side of the facility. Air monitoring of the sample registered 3 units on the PID. Sample JDF# 12 was a yellow liquid collected from a blue, poly drum. The air monitoring of the headspace of the drum revealed 106 units on the PID. The TAT observed approximately 200 drums within the facility proper. After collecting the final sample, the TATMs began hazardous categorization of the four samples collected from the facility. Sample JDF# 12 had a pH value of 14. JDF# 10 was the only sample testing positive as an oxidizer, and JDF# 9 was the only sample to test positive as combustible. All of the samples were sent to Environmental Control Technology Corporation, 3985 Research Park Drive, Ann Arbor, Michigan for analysis. Samples were analyzed for toxicity characteristic leaching procedure (TCLP) and Resource Conservation and Recovery Act (RCRA) metals including copper and zinc, pesticides and polychlorinated biphenyls (PCBs), volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), cyanide, ignitability, corrosivity, and reactivity.

4.0 ANALYTICAL RESULTS

Samples taken from the JDF site were retrieved in accordance with the site sampling plan (Appendix A). The nine waste and three



Suspected area of fill

Drum & small container sample

Soil Samples

Wooded flood plain

Date: November 9, 1993

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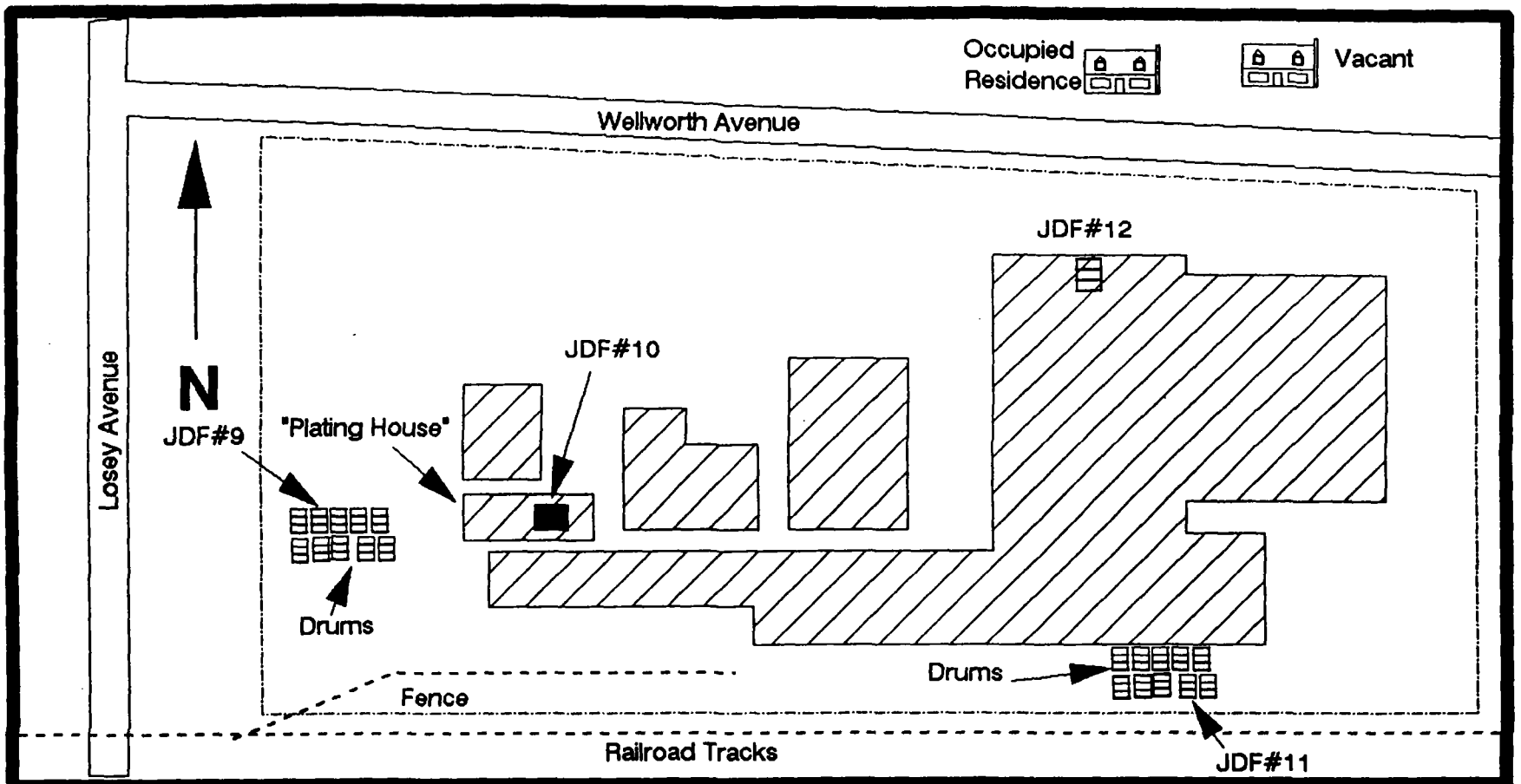
TITLE: Sample locations JDF#'s 1-8		FIGURE #: 3
SITE: Jackson Drop Forge		SCALE: Not to Scale
CITY: Jackson	STATE: Michigan	TDD #: T05-9310-011



Jackson Drop Forge Facility

Plating Vat Sample

Drum Samples

Date: November 9, 1993

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TITLE: Sample locations JDF#'s 9 - 12		FIGURE #: 4
SITE: Jackson Drop Forge		SCALE: Not to Scale
CITY: Jackson	STATE: Michigan	TDD #: T05-9310-011

soil samples were analyzed for TCLP and RCRA metals including copper and zinc (method 6010), pesticides and PCBs (method 8080), VOCs (method 8240), SVOCs (method 8270), cyanide (method 9010), ignitability (method 1010), corrosivity (method 9040), and reactivity (methods 7.3.3.2 and 7.3.4.2). Sample analysis was performed by Environmental Control Technology Corporation, 3985 Research Park Drive, Ann Arbor, Michigan, under TDD number T05-9310-813.

Analytical results of the soil and container samples are summarized in Table 1. Waste samples from containers revealed the presence of solvents which include ethylbenzene and toluene. Flash point analysis revealed three drums (JDF#s 2, 3, and 8) located in the flood plain dump area contain material with a flash point below 140 degrees Fahrenheit (°F), which is considered a RCRA hazardous waste based on characteristics of ignitability (40 Code of Federal Regulations (CFR) part 261.21). Soil analysis revealed that two samples (JDF#s 1 and 4) had TCLP lead levels at 13 and 29 mg/L. These levels are greater than the 5 mg/L which is considered a RCRA hazardous waste based on characteristic of toxicity (40 CFR part 261.24). Analysis for pH revealed one container (JDF# 10) with contents with a pH below two units, which is considered a RCRA hazardous waste based on characteristic of corrosivity (40 CFR part 261.22).

The analytical package and quality assurance review are provided in Appendix B.

5.0 DISCUSSION OF POTENTIAL THREATS

The site assessment at JDF was conducted to evaluate the threat to public health and the environment posed by the potential for imminent release of hazardous substances from the site.

The NCP provides specific criteria for evaluation of a threat and the appropriateness of a removal action in Section 300.415, Paragraph (b) (2), Subsections (i) through (viii). Observations documented during this site assessment apply to subsections i, ii, iii, iv, v, vi, and vii:

> (i) Actual or potential exposure to nearby human populations, animals, or the food chain from hazardous substances or pollutants or contaminants;

Analysis of container samples collected by the MDNR on July 15, 1993, and the TAT on October 25, 1993, document the presence of volatile organic compounds (VOCs): toluene (51,000 parts per million (ppm)), ethylbenzene (22,000 ppm), xylene (2,100 ppm), benzene (38 parts per billion (ppb)), chlorobenzene (31 ppb), 1,1-dichloroethene (34 ppb). Also noted were RCRA hazardous wastes including: toxics, corrosives, and ignitables. Access to the thousands of drums and containers, which have been dumped

TABLE 1

U.S. EPA SOIL AND DRUMS SAMPLE RESULTS
JACKSON DROP FORGE SITE
JACKSON, MICHIGAN

Parameters	Soil			Drums								
	JDF1	JDF4	JDF7	JDF2	JDF3	JDF5	JDF6	JDF8	JDF9	JDF10	JDF11	JDF12
Lead (mg/l)	13[a]	29	0.04	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium (mg/kg)	10[b]	30	14	45	3.8	5.1	91	104	ND	279,000	ND	ND
Flash Point (°F)	NA	NA	NA	71	112	>200	>200	98	>200	>200	>200	>200
pH (units)	NA	NA	NA	7.6	7.3	8.4	7.9	6.5	8.5	1.3	7.9	9.3
Reactive Cyanide (mg/kg)	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	2,000	ND
Reactive Sulfide (mg/kg)	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	550
Ethylbenzene (mg/kg)	NA	NA	NA	22,000	0.21	ND	ND	410	1,400	ND	ND	ND
Toluene (mg/kg)	NA	NA	NA	31,000	1.5	ND	ND	170	ND	ND	ND	ND

a - Results are TCLP
b - Results are totals
NA - Not Analyzed
ND - Not Detected at instrument detection limit

onto the flood plain of the Grand River, is unrestricted and available to recreational users of the river, children playing in the area, and nearby residents. This creates a potential for people to come in direct contact with hazardous wastes on the flood plain. At the same time, deterioration of the drums and containers is extreme. Many of them are without lids and have holes; much of their contents have been released onto the flood plain. As water levels along the river rise and fall with each precipitation event, spilled contaminants are released into the Grand River. These conditions also pose a risk for the animal populations in the area. The TAT observed signs of beaver, deer, rabbits, racoons, and waterfowl in the flood plain, in addition to the aquatic species that are sure to be present in riverine ecosystems.

The presence of approximately 200 drums of industrial wastes at the abandoned facility poses a similar direct contact concern. This facility is fenced, but there are gaps in and beneath the fence and some of the gates are not locked. Inside the fence, many of the facility's buildings have no doors or are unlocked. Samples document the presence of highly corrosive materials (pH - 1.3) contained in open vats, that pose a direct contact threat to unknowing persons who access the site.

(ii) Actual or potential contamination of drinking water supplies or sensitive ecosystems;

Observation of the drum dumping and mounded areas revealed that the flood plain of the Grand River, north of Wellworth Avenue, appeared to have been used to landfill bulk industrial wastes and containers. The contact of the river with the materials from spilled or leaked wastes from deteriorated drums and containers, is almost certainly causing migration of waste constituents to the river's surface water, sediments and areas further downstream. This migration has the potential to have a detrimental impact on fish and wildlife populations further downstream.

(iii) Hazardous substances or pollutants or contaminants in drums, barrels, tanks, or other bulk storage containers, that may pose a threat of release;

Virtually all of the estimated 3,000 to 5,000 surface drums and containers in the flood plain area are in poor, deteriorated condition. Many of the containers have already released their contents to the surrounding soils and surface water. Analysis of samples collected from the flood plain area has revealed the presence of hazardous wastes.

(iv) High levels of hazardous substances or pollutants or contaminants in soils largely at or near the surface, that may migrate;

TCLP analysis of soil samples revealed the soils had lead concentrations considered RCRA hazardous wastes based on the characteristic of toxicity. This condition could allow high concentrations of lead to migrate into the groundwater and river sediments.

(v) Weather conditions that may cause hazardous substances or pollutants or contaminants to migrate or be released;

Upcoming fall and winter weather conditions will cause the drums of waste to further weather and deteriorate. Rain and snow melt in the spring may flood the entire flood plain area washing wastes and drums into the river. Rain and inclement weather may cause erosion of contaminated soils and exposure of buried wastes, causing additional material to be released.

(vi) Threat of fire or explosion;

Analytical results (flash point < 140°F) of waste in the flood plain and surface drum area show that the waste is capable of sustaining ignition. Any uncontrolled fire would likely result in the emission of the known and unknown hazardous contaminants present.

With the JDF facility being unsecured the potential exists for vandals and/or vagrants to enter the facility and start fires.

(vii) The availability of other appropriate federal or state response mechanisms to respond to the release;

The MDNR has requested that U.S. EPA institute "response action" at the site since it has no funding to perform a cleanup.

6.0 SUMMARY

In summary, problems at the JDF site include: high levels of VOCs and RCRA classified hazardous wastes; the easy access to both the drum disposal area, on the flood plain, and the unsecured JDF facility; the deteriorated conditions of the drums and containers on the flood plain; the close approximation of the Grand River; and the potential for the further release and migration of contaminants into the surrounding environment.

In order to rectify the problems at the JDF site the following measures should be immediately implemented: establish site security by repairing the fence around the JDF facility, installing and/or locking all the doors at the facility, and erecting a fence around the perimeter of the drum disposal area of the flood plain; remove the drums and any contaminated soils

from the flood plain area; and prevent the river from overflowing its banks into the area of concern by installing sheet piling between the river and drum disposal area.

Observations documented during the site assessment indicate that the conditions at the JDF site constitute an imminent and substantial endangerment to public health and welfare. This conclusion is based upon observations by the OSC and the TAT, analytical results from samples collected on-site, and investigative reports from state and city officials as evaluated against the criteria set forth in the NCP.

A

SAMPLING PLAN

PURPOSE

This plan will outline the collection of samples from the Jackson Drop Forge site at 2001 Wellworth Avenue, Jackson, Jackson County, Michigan. The site includes both the facility at 2001 Wellworth Avenue and the land north of the facility from 2000 Wellworth Avenue to 2060 Wellworth Avenue. Samples will be collected from on-site drums, waste, and soils. The analytical results from these samples will be used by the U.S. EPA to determine the extent and amount of hazardous waste or hazardous substances present in the on-site drums, waste, and soils and possible off site migration of these hazardous substances. These results will also allow the U.S. EPA to determine the threat posed to human health and the environment by materials on the site.

SOILS

Soil samples will be collected from areas of visual contamination or from areas suspected to be affected by spills, leaks, or migration of potentially hazardous substances or materials in drums, buried materials, or other on-site materials. Approximately 5 surface grab samples will be collected from the soil of each area according to Ecology and Environment, Inc., soil sampling SOPs (see soil sampling SOPs in Appendix A). These 5 soil samples will be analyzed for polychlorinated biphenyls, Toxicity Characteristic Leaching Procedures (TCLP), volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), and metals. This will allow the U.S. EPA to determine if materials on-site are hazardous based on 40 CFR Section 300.

DRUMS AND SLUDGES

Liquid, sludge, and solid material located in surface drums and on-site sludges or waste not contained will be sampled. These samples will be collected to both identify the drum contents and sludges and to determine if they are hazardous. Drums will be sampled according to Ecology and Environment, Inc. standard operating procedures (SOPs) for drum and waste sampling (see Appendix A). The E & E Technical Assistance Team (TAT) will collect approximately 10 to 15 distinct samples from drums found on the surface and sludges found partially buried on-site.

The 10 to 15 liquid, sludges, and solids from drums and uncontained sludges will be analyzed for Priority Pollutants (see list in Appendix B), flash point, pH, and reactivity.

QA/QC PROTOCOL

QA level 2, according to SW-846, will be used for the United States Environmental Protection Agency (U.S. EPA) level of quality assurance. The following methods will be used for analysis:

Priority Pollutants	Various from SW-846 including Methods 8240 (volatile organic compounds [VOCs]), 8270 (semi-volatile organic compounds [SVOCs]), 8080 (polychlorinated biphenyls [PCBs]), 7000 Series/6010 (metals), and others.
Flash Point	Method 1010
pH	Method 9040
Reactivity (cyanide/ sulfide)	Method 9010/7.3.3.2
TCLP (lead)	Method 1311
TCLP VOCs	
TCLP SVOCs	
TCLP metals	

The lab will perform a matrix spike/spikes and matrix spike/duplicates for the soils, drums, and sludge samples.

SAMPLING PLAN

SITE NAME: Jackson Drop Forge

TDD#: T05-9310-011

SAMPLERS: Michael Dieckhaus
Edward Lancaster
Mark Durno

Project Code: ZT2051

LAB:

DATE OF SAMPLING:
10/ /93

DATE SHIPPED:
10/ /93

TYPE OF LAB: COMMERCIAL

GUARANTEED TURNAROUND TIME:
2 weeks verbal results/ 3 wks hardcopy

MATRIX	NO. OF SAMPLES
Soils	5
Drums/Sludges	10-15

PURPOSE OF SAMPLING:

__ Site Characterization
__ Extent of Contamination
__ Confirm Presence of Suspected Contaminant
__ Disposal/Treatment of Materials
__ Confirm Efficiency of Existing Treatment Systems
__ Other: Determine Cost Estimates for Removal and Disposal

APPENDICES:

A	Soil and Drum Sampling SOPs
B	Priority Pollutant List
C	Chain-of-Custody
D	Field Sampling and Drum Data Sheets
E	Soil and Drum Sampling Map

SAMPLING METHODS:

See attached soil and drum/sludge sampling SOPs. Approximately 20 to 30 drums will be sampled. These samples will be screened with hazard categorization procedures to determine which of the 10 drum samples will be analyzed by the commercial laboratory.

DECON PROCEDURE:

After every sample, sampling equipment will be cleaned with an alconox solution, triple rinsed with distilled water, and allowed to dry. After the samples are collected, the outside of the closed sample jars will be cleaned with an alconox solution and triple rinsed with water.

DISPOSAL OF RINSATE AND DECON MATERIALS:

Rinsate, PPE, and decon materials, with the PRP's permission, will be included with on-site wastes.

DISPOSAL OF SAMPLES:

Samples will be disposed by the laboratory performing the analyses.

ADDITIONAL MATERIALS REQUIRED:

Brass tool kit (for drum opening), thieve tubes, socket wrench (for drum opening and closing), visqueen, and duct tape (for covering drums that have been punctured.

DATA VALIDATION:

The TAT will be performing data validation of analytical results from soil, drum, and sludge samples to assure that lab results meet QA level II standards.

FIELD SAMPLING DATA SHEETS:

A field sampling or drum data sheet will be completed by the TAT for each soil, drum and sludge sample Field sampling and drum data sheets will record a description of the material, corresponding number of the sample, air monitoring readings, thickness of layer, and analyses to be performed on the soil, drum contents, or sludge.

SAMPLE NUMBERING AND JAR LABELLING

Soil, drum, and sludge sample jars will be numbered, and the corresponding number will be placed on the field sampling or drum data sheets for all soil, drum, and sludge samples. Sample jars will have the sample number placed on the lid of the jar as well as a label placed on the side of the jar.

SOILS

No. of Samples: 5 No. of Grabs: 5
No. of Composites: 0
No. of Duplicates: 1

****

ANALYSIS	NO. OF SAMPLES	SAMPLE QUANTITY
TCLP VOCs	5	oz
TCLP SVOCs	5	oz
TCLP Metals	5	oz
	Quantity per Sample:	oz

TOTAL NO. OF CONTAINERS REQUIRED:

_____ oz clear wide-mouth glass

Ice required as a preservative.

DRUMS/SLUDGES

No. of Samples: 10-15 No. of Composites: 0

No. of Duplicates: 2 No. of Grabs: 10-15

Total Number of Sludge Samples (both grabs and composites): 15-17

****

ANALYSIS	NO. OF SAMPLES	SAMPLE QUANTITY
Priority Pollutants	15-17	oz
pH	15-17	oz
Flash point	15-17	oz
Reactivity	15-17	oz
	Quantity per Sample:	oz

TOTAL NO. OF CONTAINERS REQUIRED:

_____ 32 oz clear wide-mouth glass

_____ 4 oz clear wide-mouth glass (for VOC analysis)

_____ 16 oz clear wide-mouth glass (for TCLP lead analysis)

Ice required as a preservative.

PLAN REVIEWED BY: _____

B

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M E M O R A N D U M

DATE: December 1, 1993

TO: Ed Lancaster, Project Manager, TAT, Detroit, MI EL

FROM: Lee Ende, QA/QC Officer, TAT, Chicago, IL

THRU: Pat Zwilling, Chemist, ATATL, Chicago, IL

SUBJ: **Flashpoint, pH and Reactive Sulfide and Cyanide Data Quality Assurance Review,** Jackson Drop Forge, Jackson, Jackson County, Michigan

REF: Analytical TDD: T059310813 Project TDD: T059310011
Analytical PAN: EMI1352AAA Project PAN: EMI1352SAA

The data quality assurance review of nine waste solid and liquid samples collected from the Jackson Drop Forge site in Jackson, Michigan has been completed. U.S. EPA approved methodology (pH - Method 9040 for aqueous and 9045 for solid, Flashpoint - Method 1010, Reactive Sulfide - Method 7.3.4.2 and Reactive Cyanide - Method 7.3.3.2) was utilized to analyze all the samples. All analyses were performed by Environmental Control Technology Corporation located in Ann Arbor, Michigan.

The samples were numbered:

FIELD #	LAB #
JDF 2	200023375
JDF 3	200023376
JDF 5	200023377
JDF 6	200023378
JDF8 - 12	200023379 - 83

The laboratory reported problems with the cyanide analysis for JDF 2. The presence of solvents in the sample resulted in the potential for a false positive therefore, the detection limit has been elevated.

The concentration of reactive cyanide in the sample JDF 11 was higher than the total cyanide. The lab could not reanalyze the sample due to insufficient volume.

DATA QUALIFICATIONS

I Holding Times: Acceptable.

The samples were collected on October 26, 1993 and analyzed between October 29 and November 1, 1993. The OSWER Directive nor the methods state specific holding times for these parameters. Other references consulted states a holding time for cyanide of 14 days and 7 days for sulfide. In the professional judgement of this reviewer, the analysis time is acceptable.

II Initial and Continuing Calibration: Acceptable.

Calibration per parameter is adequate.

III Blanks: Acceptable.

Raw data accurately reported the absence of any contaminating analytes above the Instrument Detection Limits (IDL) for sulfide and cyanide tests. Blanks were not used for the pH and flashpoint tests.

IV Compound Quantitation/Reported Detections Limits: Acceptable.

The lab reported insufficient sample volumes for samples JDF 10 through 12. The lab needed to deviate from the standard method in order to perform the analysis. The results reported for the samples may be inaccurate.

V Laboratory Control Samples: Acceptable.

Control samples were run for all parameters except pH. All recoveries were within control limits. Recovery for the cyanide analysis was 17%; it is a low recovery but this is not qualified because it is inherent in the method.

VI Duplicates: Acceptable.

Duplicates were run for all parameters. All results were within the required control limits.

IX Overall Assessment of Data for Use

The overall usefulness of the data is based on the criteria outlined in "Quality Assurance/Quality Control Guidance For Removal Activities" (OSWER Directive 9360.4-01 April 1990). Based upon the information provided, the data are acceptable for use.

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International Specialists in the Environment

M E M O R A N D U M

DATE: December 1, 1993

TO: Ed Lancaster, Project Manager, TAT, Detroit, MI EdL

FROM: Lee Ende, QA/QC Officer, TAT, Chicago, IL

THRU: Pat Zwilling, Chemist, ATATL, Chicago, IL

SUBJ: **Inorganic Data Quality Assurance Review,** Jackson Drop Forge, Jackson, Jackson County, Michigan

REF: Analytical TDD: T059310813 Project TDD: T059310011
Analytical PAN: EMI1352AAA Project PAN: EMI1352SAA

The data quality assurance review of twelve waste and soil samples collected from the Jackson Drop Forge site in Jackson, Michigan has been completed. U.S. EPA approved methodology was utilized to analyze all the samples (Series 6000 - 7000). Every sample was analyzed for **Total RCRA Metals plus Copper and Zinc.** Three samples (JDF 1, JDF 4 and JDF 7) were analyzed for **TCLP Metals.** All analyses were performed by Environmental Control Technology Corporation located in Ann Arbor, Michigan.

The samples were numbered:

FIELD #	LAB #
JDF 1	200023372
JDF 2	200023375
JDF 3	200023376
JDF 4	200023373
JDF 5	200023377
JDF 6	200023378
JDF 7	200023374
JDF 8 - 12	200023379 through 200023383,

DATA QUALIFICATIONS

I Holding Times: Acceptable.

The samples were collected on October 26, 1993 and analyzed between October 28 and November 1, 1993. This met the six month requirement for Metals as well as the twenty-eight day requirement for Mercury.

II Initial and Continuing Calibration: Acceptable.

The Percent Recoveries (%R) for the verification samples were within the QC limits; all metals (90-110%) except for mercury (80-120%).

III Blanks: Acceptable.

Raw data accurately reported the absence of any contaminating analytes above the Instrument Detection Limits (IDL).

IV Interference Check Sample Analysis: Acceptable.

Results for the ICS analysis fell within the ±20% range of the true value.

V Laboratory Control Sample Analysis: Acceptable.

Liquid LCS recoveries were between 92 and 115% and the solid LCS recoveries were between 88 and 115% which are within the required control limits.

VI Duplicate Sample Analysis: Acceptable.

Duplicate analysis results fell within the appropriate control windows of +/- 20% for liquids and +/- 35% for solids.

VII Matrix Spike Analysis: Qualified.

Percent Recoveries (%R) and Relative Percent Differences (RPD) between MS and MSD recoveries were all within the advisory QC limits of 80-120% except for Barium 76.7%, Chromium 33.6%, copper 239%, Nickel 19.6%, Selenium 121.4% and Zinc 26.5% in sample JDF 4. All sample results for the above listed compounds have been qualified as estimated (J) with a +/- indication for the percent recovery being above or below the control limits.

JDF 1 contained a mercury spike which was within the control limits.

VIII Serial Dilution: Qualified.

The percent difference for a serial dilution must be within 10%. Chromium and Nickel were not within the control limits for sample JDF 7 therefore, the results for these compounds will be qualified as estimated (J).

IX Overall Assessment of Data for Use

The overall usefulness of the data is based on the criteria outlined in "Quality Assurance/Quality Control Guidance For Removal Activities" (OSWER Directive 9360.4-01 April 1990). Based upon the information provided, the data are acceptable for use with the above stated data qualifications.

Data Qualifiers and Definitions

J - The associated numerical value is an estimated quantity because the reported concentrations were less than the contract required detection limits or quality control criteria were not met.

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE NO.

JDF 1

Lab Name: ENCOTEC Client: Ecology & Environment

SDG No.: EE-SW-101 Lab Sample ID: 200023372

Matrix: Soil Date Sampled: 10/25/93

% Solids: 87.6 Date Received: 10/27/93

U= Analyte not detected

Analyte	Analysis Date	Method	Conc.	Units	Detection Limit
Antimony					
Arsenic	11/01/93	7061	5.0	mg/Kg	0.50
Barium	10/29/93	6010	53	mg/Kg	0.90
Beryllium					
Cadmium	10/29/93	6010	0.52	mg/Kg	0.22
Chromium	10/29/93	6010	10	mg/Kg	0.90
Copper	10/29/93	6010	119	mg/Kg	0.90
Lead	10/29/93	6010	1990	mg/Kg	1.8
Mercury	10/29/93	7471	U	mg/Kg	0.031
Nickel					
Selenium	11/01/93	7741	0.05	mg/Kg	0.05
Silver	10/29/93	6010	U	mg/Kg	0.46
Thallium					
Zinc	10/29/93	6010	42	mg/Kg	0.90
Total CN					
Reactive CN					
Reactive S2					
Flashpoint					
pH					

Results reported on a dry weight basis.

Comments: Reactive CN = reactive cyanide
Reactive S2 = reactive sulfide

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE NO.

JDF 2

Lab Name: ENCOTEC Client: Ecology & Environment

SDG No.: EE-SW-101 Lab Sample ID: 200023375

Matrix: Waste Date Sampled: 10/25/93

% Solids: 63.0 Date Received: 10/27/93

U= Analyte not detected

Analyte	Analysis Date	Method	Conc.	Units	Detection Limit
Antimony	10/29/93	6010	U	mg/Kg	2.1
Arsenic	11/01/93	7061	0.39	mg/Kg	0.04
Barium					
Beryllium	10/29/93	6010	U	mg/Kg	0.21
Cadmium	10/29/93	6010	0.37	mg/Kg	0.21
Chromium	10/29/93	6010	45	mg/Kg	0.84
Copper	10/29/93	6010	3.7	mg/Kg	0.84
Lead	10/29/93	6010	2.2	mg/Kg	1.7
Mercury	10/29/93	7471	U	mg/Kg	0.019
Nickel	10/29/93	6010	209	mg/Kg	0.84
Selenium	11/01/93	7741	U	mg/Kg	0.04
Silver	10/29/93	6010	U	mg/Kg	0.42
Thallium	10/29/93	6010	U	mg/Kg	2.1
Zinc	10/29/93	6010	30	mg/Kg	0.84
Total CN	10/28/93	9010	U	mg/Kg	0.50 *
Reactive CN	10/30/93		U	mg/Kg	200
Reactive S2	10/30/93		U	mg/Kg	50
Flashpoint	10/30/93	1010	71	deg F	--
pH	10/30/93	9040	7.6	su	--

Results reported on a wet weight basis.

Comments: Reactive CN = reactive cyanide method 7.3.3.2
Reactive S2 = reactive sulfide method 7.3.4.2

*Elevated detection limit due to matrix interference.

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE NO.

JDF 3

Lab Name: ENCOTEC Client: Ecology & Environment

SDG No.: EE-SW-101 Lab Sample ID: 200023376

Matrix: Waste Date Sampled: 10/25/93

% Solids: 83.4 Date Received: 10/27/93

U= Analyte not detected

Analyte	Analysis Date	Method	Conc.	Units	Detection Limit
Antimony	10/29/93	6010	U	mg/Kg	2.4
Arsenic	11/01/93	7061	0.26	mg/Kg	0.05
Barium					
Beryllium	10/29/93	6010	U	mg/Kg	0.24
Cadmium	10/29/93	6010	1.1	mg/Kg	0.24
Chromium	10/29/93	6010	3.8	mg/Kg	0.97
Copper	10/29/93	6010	6.7	mg/Kg	0.97
Lead	10/29/93	6010	18	mg/Kg	1.9
Mercury	10/29/93	7471	0.034	mg/Kg	0.031
Nickel	10/29/93	6010	4.8	mg/Kg	0.97
Selenium	11/01/93	7741	0.07	mg/Kg	0.05
Silver	10/29/93	6010	U	mg/Kg	0.48
Thallium	10/29/93	6010	U	mg/Kg	2.4
Zinc	10/29/93	6010	88	mg/Kg	0.97
Total CN	10/28/93	9010	0.19	mg/Kg	0.10
Reactive CN	10/30/93		U	mg/Kg	200
Reactive S2	10/30/93		U	mg/Kg	50
Flashpoint	10/30/93	1010	112	deg F	--
pH	10/30/93	9040	7.3	su	--

Results reported on a wet weight basis.

Comments: Reactive CN = reactive cyanide method 7.3.3.2
Reactive S2 = reactive sulfide method 7.3.4.2

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE NO.

JDF 4

Lab Name: ENCOTEC Client: Ecology & Environment

SDG No.: EE-SW-101 Lab Sample ID: 200023373

Matrix: Soil Date Sampled: 10/25/93

% Solids: 90.1 Date Received: 10/27/93

U= Analyte not detected

Analyte	Analysis Date	Method	Conc.	Units	Detection Limit
Antimony					
Arsenic	11/01/93	7061	2.5	mg/Kg	0.60
Barium	10/29/93	6010	61	mg/Kg	1.1
Beryllium					
Cadmium	10/29/93	6010	0.86	mg/Kg	0.26
Chromium	10/29/93	6010	30	mg/Kg	1.1
Copper	10/29/93	6010	168	mg/Kg	1.1
Lead	10/29/93	6010	5820	mg/Kg	9.5
Mercury	10/29/93	7471	U	mg/Kg	0.029
Nickel					
Selenium	11/01/93	7741	0.10	mg/Kg	0.05
Silver	10/29/93	6010	U	mg/Kg	0.53
Thallium					
Zinc	10/29/93	6010	61	mg/Kg	1.1
Total CN					
Reactive CN					
Reactive S2					
Flashpoint					
pH					

Results reported on a dry weight basis.

Comments: Reactive CN = reactive cyanide
Reactive S2 = reactive sulfide

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE NO.

JDF 5

Lab Name: ENCOTEC Client: Ecology & Environment

SDG No.: EE-SW-101 Lab Sample ID: 200023377

Matrix: Waste Date Sampled: 10/25/93

% Solids: 78.5 Date Received: 10/27/93

U= Analyte not detected

Analyte	Analysis Date	Method	Conc.	Units	Detection Limit
Antimony	10/29/93	6010	U	mg/Kg	2.2
Arsenic	11/01/93	7061	0.60	mg/Kg	0.05
Barium					
Beryllium	10/29/93	6010	U	mg/Kg	0.22
Cadmium	10/29/93	6010	1.1	mg/Kg	0.22
Chromium	10/29/93	6010	5.1	mg/Kg	0.90
Copper	10/29/93	6010	10	mg/Kg	0.90
Lead	10/29/93	6010	52	mg/Kg	1.8
Mercury	10/29/93	7471	U	mg/Kg	0.03
Nickel	10/29/93	6010	6.8	mg/Kg	0.90
Selenium	11/01/93	7741	U	mg/Kg	0.05
Silver	10/29/93	6010	U	mg/Kg	0.44
Thallium	10/29/93	6010	U	mg/Kg	2.2
Zinc	10/29/93	6010	31	mg/Kg	0.90
Total CN	10/28/93	9010	U	mg/Kg	0.10
Reactive CN	10/30/93		U	mg/Kg	200
Reactive S2	10/30/93		U	mg/Kg	50
Flashpoint	10/30/93	1010	>200	deg F	--
pH	10/30/93	9040	8.4	su	--

Results reported on a wet weight basis.

Comments: Reactive CN = reactive cyanide method 7.3.3.2
Reactive S2 = reactive sulfide method 7.3.4.2

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE NO.

JDF 6

Lab Name: ENCOTEC Client: Ecology & Environment

SDG No.: EE-SW-101

Matrix: Waste

% Solids: 59.3

Lab Sample ID: 200023378

Date Sampled: 10/25/93

Date Received: 10/27/93

U= Analyte not detected

Analyte	Analysis Date	Method	Conc.	Units	Detection Limit
Antimony	10/29/93	6010	U	mg/Kg	4.7 *
Arsenic	11/01/93	7061	0.49	mg/Kg	0.05
Barium					
Beryllium	10/29/93	6010	U	mg/Kg	0.47*
Cadmium	10/29/93	6010	U	mg/Kg	0.47*
Chromium	10/29/93	6010	91	mg/Kg	1.9 *
Copper	10/29/93	6010	9.1	mg/Kg	1.9 *
Lead	10/29/93	6010	5.1	mg/Kg	3.8 *
Mercury	10/29/93	7471	0.035	mg/Kg	0.021
Nickel	10/29/93	6010	308	mg/Kg	1.9 *
Selenium	11/01/93	7741	U	mg/Kg	0.05
Silver	10/29/93	6010	U	mg/Kg	0.95*
Thallium	10/29/93	6010	U	mg/Kg	4.7 *
Zinc	10/29/93	6010	40	mg/Kg	1.9 *
Total CN	10/28/93	9010	U	mg/Kg	0.10
Reactive CN	10/30/93		U	mg/Kg	200
Reactive S2	10/30/93		U	mg/Kg	50
Flashpoint	11/01/93	1010	>200	deg F	--
pH	10/30/93	9040	7.9	su	--

Results reported on a wet weight basis.

Comments: Reactive CN = reactive cyanide method 7.3.3.2
Reactive S2 = reactive sulfide method 7.3.4.2

*Elevated detection limits due to matrix interference.

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE NO.

JDF 7

Lab Name: ENCOTEC Client: Ecology & Environment

SDG No.: EE-SW-101 Lab Sample ID: 200023374

Matrix: Soil Date Sampled: 10/25/93

% Solids: 25.4 Date Received: 10/27/93

U= Analyte not detected

Analyte	Analysis Date	Method	Conc.	Units	Detection Limit
Antimony					
Arsenic	11/01/93	7061	17	mg/Kg	1.6
Barium	10/29/93	6010	894	mg/Kg	3.1
Beryllium					
Cadmium	10/29/93	6010	2.3	mg/Kg	0.78
Chromium	10/29/93	6010	14	mg/Kg	3.1
Copper	10/29/93	6010	41	mg/Kg	3.1
Lead	10/29/93	6010	75	mg/Kg	6.2
Mercury	10/29/93	7471	0.20	mg/Kg	0.052
Nickel					
Selenium	11/01/93	7741	0.98*	mg/Kg	0.20
Silver	10/29/93	6010	U	mg/Kg	1.6
Thallium					
Zinc	10/29/93	6010	506	mg/Kg	3.1
Total CN					
Reactive CN					
Reactive S2					
Flashpoint					
pH					

Results reported on a dry weight basis.

Comments: Reactive CN = reactive cyanide

Reactive S2 = reactive sulfide

*Suspected matrix interference.

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE NO.

JDF 8

Lab Name: ENCOTEC Client: Ecology & Environment

SDG No.: EE-SW-101 Lab Sample ID: 200023379

Matrix: Waste Date Sampled: 10/25/93

% Solids: 94.3 Date Received: 10/27/93

U= Analyte not detected

Analyte	Analysis Date	Method	Conc.	Units	Detection Limit
Antimony	10/29/93	6010	U	mg/Kg	4.2 *
Arsenic	11/01/93	7061	0.63	mg/Kg	0.05
Barium					
Beryllium	10/29/93	6010	U	mg/Kg	0.42*
Cadmium	10/29/93	6010	U	mg/Kg	0.42*
Chromium	10/29/93	6010	104	mg/Kg	1.7 *
Copper	10/29/93	6010	6.6	mg/Kg	1.7 *
Lead	10/29/93	6010	U	mg/Kg	3.3 *
Mercury	10/29/93	7471	0.089	mg/Kg	0.017
Nickel	10/29/93	6010	367	mg/Kg	1.7 *
Selenium	11/01/93	7741	0.05	mg/Kg	0.05
Silver	10/29/93	6010	U	mg/Kg	0.84*
Thallium	10/29/93	6010	U	mg/Kg	4.2 *
Zinc	10/29/93	6010	42	mg/Kg	1.7 *
Total CN	10/28/93	9010	U	mg/Kg	0.10
Reactive CN	10/30/93		U	mg/Kg	200
Reactive S2	10/30/93		U	mg/Kg	50
Flashpoint	11/01/93	1010	98	deg F	--
pH	10/30/93	9040	6.5	su	--

Results reported on a wet weight basis.

Comments: Reactive CN = reactive cyanide method 7.3.3.2

Reactive S2 = reactive sulfide method 7.3.4.2

*Elevated detection limits due to matrix interference.

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE NO.

JDF 9

Lab Name: ENCOTEC Client: Ecology & Environment

SDG No.: EE-SW-101 Lab Sample ID: 200023380

Matrix: Waste Date Sampled: 10/25/93

% Solids: NA Date Received: 10/27/93

U= Analyte not detected

Analyte	Analysis Date	Method	Conc.	Units	Detection Limit
Antimony	10/29/93	6010	U	mg/Kg	2.2
Arsenic	11/01/93	7061	0.21	mg/Kg	0.05
Barium					
Beryllium	10/29/93	6010	U	mg/Kg	0.23
Cadmium	10/29/93	6010	U	mg/Kg	0.23
Chromium	10/29/93	6010	U	mg/Kg	0.93
Copper	10/29/93	6010	6.4	mg/Kg	0.93
Lead	10/29/93	6010	U	mg/Kg	1.9
Mercury	10/29/93	7471	U	mg/Kg	0.024
Nickel	10/29/93	6010	U	mg/Kg	0.93
Selenium	11/01/93	7741	0.06	mg/Kg	0.05
Silver	10/29/93	6010	U	mg/Kg	0.46
Thallium	10/29/93	6010	U	mg/Kg	2.2
Zinc	10/29/93	6010	194	mg/Kg	1.9
Total CN	10/28/93	9010	U	mg/Kg	0.10
Reactive CN	10/30/93		U	mg/Kg	200
Reactive S2	10/30/93		U	mg/Kg	50
Flashpoint	10/30/93	1010	>200	deg F	--
pH	10/30/93	9040	8.5	su	--

Results reported on a wet weight basis.

Comments: Reactive CN = reactive cyanide method 7.3.3.2
Reactive S2 = reactive sulfide method 7.3.4.2

Oil matrix - could not obtain % total solids

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE NO.

JDF 10

Lab Name: ENCOTEC Client: Ecology & Environment

SDG No.: EE-SW-101 Lab Sample ID: 200023381

Matrix: Waste Date Sampled: 10/25/93

% Solids: NA Date Received: 10/27/93

U= Analyte not detected

Analyte	Analysis Date	Method	Conc.	Units	Detection Limit
Antimony	11/01/93	6010	U	mg/L	0.25
Arsenic	11/01/93	7061	2.9	mg/L	0.50
Barium					
Beryllium	11/01/93	6010	0.43	mg/L	0.10
Cadmium	11/01/93	6010	U	mg/L	0.025
Chromium	11/01/93	6010	279000	mg/L	1000.00
Copper	11/01/93	6010	1040	mg/L	1.00
Lead	11/01/93	6010	22	mg/L	0.20
Mercury	10/29/93	7470	U	mg/L	0.0019
Nickel	11/01/93	6010	32	mg/L	0.10
Selenium	11/01/93	7741	U	mg/L	0.005
Silver	11/01/93	6010	3.0	mg/L	0.05
Thallium	11/01/93	6010	228	mg/L	2.5
Zinc	11/01/93	6010	2340	mg/L	1.00
Total CN	10/28/93	9010	U	mg/L	0.10
Reactive CN	10/30/93		U	mg/Kg	200
Reactive S2	10/30/93		U	mg/Kg	50
Flashpoint	11/01/93	1010	>200	deg F	--
pH	10/30/93	9040	1.3	su	--

Comments: Reactive CN = reactive cyanide method 7.3.3.2
Reactive S2 = reactive sulfide method 7.3.4.2
Elevated detection limits due to lack of sample volume. See narrative regarding flashpoint results.

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE NO.

JDF 11

Lab Name: ENCOTEC Client: Ecology & Environment

SDG No.: EE-SW-101 Lab Sample ID: 200023382

Matrix: Waste Date Sampled: 10/25/93

% Solids: NA Date Received: 10/27/93

U= Analyte not detected

Analyte	Analysis Date	Method	Conc.	Units	Detection Limit
Antimony	11/01/93	6010	U	mg/L	0.25
Arsenic	11/01/93	7061	U	mg/L	0.005
Barium					
Beryllium	11/01/93	6010	U	mg/L	0.025
Cadmium	11/01/93	6010	U	mg/L	0.025
Chromium	11/01/93	6010	U	mg/L	0.10
Copper	11/01/93	6010	U	mg/L	0.10
Lead	11/01/93	6010	U	mg/L	0.20
Mercury	10/29/93	7470	U	mg/L	0.0019
Nickel	11/01/93	6010	U	mg/L	0.10
Selenium	11/01/93	7741	U	mg/L	0.005
Silver	11/01/93	6010	U	mg/L	0.05
Thallium	11/01/93	6010	U	mg/L	0.25
Zinc	11/01/93	6010	0.25	mg/L	0.10
Total CN	10/28/93	9010	U	mg/L	0.10
Reactive CN	10/30/93		2000	mg/Kg	200
Reactive S2	10/30/93		U	mg/Kg	50
Flashpoint	11/01/93	1010	>200	deg F	--
pH	10/30/93	9040	7.9	su	--

Comments: Reactive CN = reactive cyanide method 7.3.3.2
Reactive S2 = reactive sulfide method 7.2.4.2
Elevated detection limits due to lack of sample volume. See narrative reagarding cyanide and flashpoint results.

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE NO.

JDF 12

Lab Name: ENCOTEC Client: Ecology & Environment

SDG No.: EE-SW-101 Lab Sample ID: 200023383

Matrix: Waste Date Sampled: 10/25/93

% Solids: NA Date Received: 10/27/93

U= Analyte not detected

Analyte	Analysis Date	Method	Conc.	Units	Detection Limit
Antimony	11/01/93	6010	U	mg/L	0.25
Arsenic	11/01/93	7061	U	mg/L	0.005
Barium					
Beryllium	11/01/93	6010	U	mg/L	0.025
Cadmium	11/01/93	6010	U	mg/L	0.025
Chromium	11/01/93	6010	U	mg/L	0.10
Copper	11/01/93	6010	U	mg/L	0.10
Lead	11/01/93	6010	U	mg/L	0.20
Mercury	10/29/93	7470	U	mg/L	0.0019
Nickel	11/01/93	6010	U	mg/L	0.10
Selenium	11/01/93	7741	U	mg/L	0.005
Silver	11/01/93	6010	U	mg/L	0.05
Thallium	11/01/93	6010	U	mg/L	0.25
Zinc	11/01/93	6010	0.11	mg/L	0.10
Total CN	10/28/93	9010	1.0	mg/L	0.10
Reactive CN	10/30/93		U	mg/Kg	200
Reactive S2	10/30/93		550	mg/Kg	50
Flashpoint	11/01/93	1010	>200	deg F	--
pH	10/30/93	9040	9.3	su	--

Comments: Reactive CN = reactive cyanide method 7.3.3.2

Reactive S2 = reactive sulfide method 7.3.4.2

Elevated detection limits due to lack of sample volume.

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE NO.

JDF 1

Lab Name: ENCOTEC Client: Ecology & Environment

SDG No.: EE-SW-101 Lab Sample ID: 200023384

Matrix: TCLP Extract Date Sampled: 10/25/93

% Solids: NA Date Received: 10/27/93

U= Analyte not detected

Analyte	Analysis Date	Method	Conc.	Units	Detection Limit
Antimony					
Arsenic	11/01/93	7061	0.002	mg/L	0.002
Barium	11/01/93	6010	0.67	mg/L	0.02
Beryllium					
Cadmium	11/01/93	6010	U	mg/L	0.005
Chromium	11/01/93	6010	U	mg/L	0.02
Copper	11/01/93	6010	U	mg/L	0.02
Lead	11/01/93	6010	13	mg/L	0.04
Mercury	10/29/93	7470	U	mg/L	0.0002
Nickel					
Selenium	11/01/93	7741	U	mg/L	0.002
Silver	11/01/93	6010	U	mg/L	0.01
Thallium					
Zinc	11/01/93	6010	0.43	mg/L	0.02
Total CN					
Reactive CN					
Reactive S2					
Flashpoint					
pH					

Comments: Reactive CN = reactive cyanide
Reactive S2 = reactive sulfide

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE NO.

JDF 4

Lab Name: ENCOTEC Client: Ecology & Environment

SDG No.: EE-SW-101 Lab Sample ID: 200023385

Matrix: TCLP Extract Date Sampled: 10/25/93

% Solids: NA Date Received: 10/27/93

U= Analyte not detected

Analyte	Analysis Date	Method	Conc.	Units	Detection Limit
Antimony					
Arsenic	11/01/93	7061	0.007	mg/L	0.002
Barium	11/01/93	6010	0.66	mg/L	0.02
Beryllium					
Cadmium	11/01/93	6010	U	mg/L	0.005
Chromium	11/01/93	6010	U	mg/L	0.02
Copper	11/01/93	6010	0.04	mg/L	0.02
Lead	11/01/93	6010	29	mg/L	0.04
Mercury	10/29/93	7470	U	mg/L	0.0002
Nickel					
Selenium	11/01/93	7741	U	mg/L	0.002
Silver	11/01/93	6010	U	mg/L	0.01
Thallium					
Zinc	11/01/93	6010	0.52	mg/L	0.02
Total CN					
Reactive CN					
Reactive S2					
Flashpoint					
pH					

Comments: Reactive CN = reactive cyanide
Reactive S2 = reactive sulfide

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE NO.

JDF 7

Lab Name: ENCOTEC Client: Ecology & Environment

SDG No.: EE-SW-101 Lab Sample ID: 200023386

Matrix: TCLP Extract Date Sampled: 10/25/93

% Solids: NA Date Received: 10/27/93

U= Analyte not detected

Analyte	Analysis Date	Method	Conc.	Units	Detection Limit
Antimony					
Arsenic	11/01/93	7061	0.004	mg/L	0.002
Barium	11/01/93	6010	0.94	mg/L	0.02
Beryllium					
Cadmium	11/01/93	6010	U	mg/L	0.005
Chromium	11/01/93	6010	U	mg/L	0.02
Copper	11/01/93	6010	U	mg/L	0.02
Lead	11/01/93	6010	0.04	mg/L	0.04
Mercury	10/29/93	7470	U	mg/L	0.0002
Nickel					
Selenium	11/01/93	7741	U	mg/L	0.002
Silver	11/01/93	6010	U	mg/L	0.01
Thallium					
Zinc	11/01/93	6010	0.92	mg/L	0.02
Total CN					
Reactive CN					
Reactive S2					
Flashpoint					
pH					

Comments: Reactive CN = reactive cyanide
Reactive S2 = reactive sulfide

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M E M O R A N D U M

DATE: December 6, 1993

TO: Ed Lancaster, Project Manager, E&E, Detroit, MI EEL

FROM: Yvette Anderson, TAT-Chemist, E&E, Chicago, IL ya

THRU: Lisa Ende, QA/QC Officer, E&E, Chicago, IL

SUBJ: **Polychlorinated Biphenyl Data Quality Assurance Review,** Jackson Drop Forge Site, Jackson, Jackson County, Michigan.

REF: Analytical TDD: T059310813 Project TDD: T059310011
Analytical PAN: EMI1352AAA Project PAN: EMI1352SAA

The data quality assurance review of 3 soil samples collected from the Jackson Drop Forge site in Jackson, Michigan has been completed. Analysis for **Polychlorinated Biphenyls (PCBs)** was performed by Environmental Control Technology Corporation of Ann Arbor, Michigan, in accordance with U.S. EPA Method 8080.

The samples were numbered JDF1, JDF4, and JDF7 in the field, and the laboratory numbered the samples 200023372, 200023373, and 200023374, respectively.

Data Qualifications:

I **Sample Holding Time: Acceptable.**

The samples were collected on 10/25/93, extracted on 10/27/93, and analyzed on 10/28-29/93. The holding time criteria of 14 days for soils from collection to extraction was satisfied. The analysis of the samples was completed within the 40 day holding time requirement after extraction.

II **Instrument Performance: Acceptable.**

The quality control criteria established for the retention time shift of less than .3% on a capillary column were acceptable. Peak resolution was greater than 25%.

III Calibration: Qualified.

A. Initial Calibration:

A 3-point calibration check was performed prior to sample analysis. The Relative Standard Deviations (RSDs) of all calibration factors for all Arochlors met quality control criteria of less than or equal to 10% with the exception of Arochlor 1221 (13), 1248 (19), and 1254 (14). These data have been qualified estimated (UJ) because control criteria were not met. Arochlor 1254 found in sample JDF7 has been qualified estimated (J) because criteria was not met.

B. Continuing Calibration:

The percent difference (%D) requirements of less than 15% were acceptable for all data, except Arochlor 1248 (17) which has been previously qualified.

IV Method Blanks: Acceptable.

A method blank was analyzed with the samples. No contaminants were detected above the instrument detection limit.

V Optional Additional QC: Acceptable.

Surrogate Recovery:

The Dibutylchlorendate (DBC) recovery limit for soils of 20-150% were satisfied.

VI Compound Identification: Acceptable.

Dual column confirmation identified the same Arochlor.

VII Overall Assessment of Data for Use

The overall usefulness of the data is based on the criteria outlined in "Quality Assurance/Quality Control Guidance For Removal Activities" (OSWER Directive 9360.4-01, April 1990).

Based upon the information provided, the data are acceptable for use with the above stated data qualifications.

Data Qualifiers and Definitions

J - The associated numerical value is an estimated quantity because the reported concentrations were less than the contract required detection limits or quality control criteria were not met.

UJ - The material was analyzed for, but was not detected. The reported detection limit is estimated because quality control criteria were not met.

1D

PCB ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

JDF 1

Lab Name: ENCOTEC Client: ECO & ENVIR

Lab Code: ENCOT Case No.: Sub No.: 100003928 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 23372

Sample wt/vol: 30.00 (g/mL) g Lab File ID: 23372

% Moisture: 12 decanted: (Y/N) Date Received: 10/27/93

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 10/27/93

Concentrated Extract Volume: 20000 (uL) Date Analyzed: 10/29/93

Injection Volume: 3.00 (uL) Dilution Factor: 50.00

GPC Cleanup: (Y/N) N pH: Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg	
12674-11-2	Aroclor-1016	1900	U
11104-28-2	Aroclor-1221	1900	U J
11141-16-5	Aroclor-1232	1900	U
53469-21-9	Aroclor-1242	1900	U
12672-29-6	Aroclor-1248	1900	U
11097-69-1	Aroclor-1254	1900	U J
11096-82-5	Aroclor-1260	1900	U J

1D

PCB ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

JDF 4

Lab Name: ENCOTEC Client: ECO & ENVIR.

Lab Code: ENCOT Case No.: Sub No.: 100003928 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 23373

Sample wt/vol: 29.99 (g/mL) g Lab File ID: 23373

% Moisture: 10 decanted: (Y/N) Date Received: 10/27/93

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 10/27/93

Concentrated Extract Volume: 20000 (uL) Date Analyzed: 10/29/93

Injection Volume: 3.00 (uL) Dilution Factor: 50.00

GPC Cleanup: (Y/N) N pH: Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg	
12674-11-2	Aroclor-1016	1800	U
11104-28-2	Aroclor-1221	1800	UJ
11141-16-5	Aroclor-1232	1800	U
53469-21-9	Aroclor-1242	1800	U
12672-29-6	Aroclor-1248	1800	UJ
11097-69-1	Aroclor-1254	1800	UJ
11096-82-5	Aroclor-1260	1800	U

1D

PCB ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

JDF 7

Lab Name: ENCOTEC Client: ECO & ENVIR.

Lab Code: ENCOT Case No.: Sub No.: 100003928 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 23374

Sample wt/vol: 29.99 (g/mL) g Lab File ID: 23374

% Moisture: 75 decanted: (Y/N) Date Received: 10/27/93

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 10/27/93

Concentrated Extract Volume: 20000 (uL) Date Analyzed: 10/28/93

Injection Volume: 3.00 (uL) Dilution Factor: 10.00

GPC Cleanup: (Y/N) N pH: Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg	
12674-11-2	Aroclor-1016	1300	U
11104-28-2	Aroclor-1221	1300	UJ
11141-16-5	Aroclor-1232	1300	U
53469-21-9	Aroclor-1242	1300	U
12672-29-6	Aroclor-1248	1300	UJ
11097-69-1	Aroclor-1254	5200	J
11096-82-5	Aroclor-1260	3200	

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MEMORANDUM

DATE: December 6, 1993

TO: Ed Lancaster, Project Manager, E&E, Detroit, MI

FROM: Yvette Anderson, TAT-Chemist, E&E, Chicago, IL ya

THRU: Lisa Ende, QA/QC Officer, E&E, Chicago, IL

SUBJ: **Pesticide Data Quality Assurance Review**, Jackson Drop Forge Site, Jackson, Jackson County, Michigan.

REF: Analytical TDD: T059310813 Project TDD: T059310011
Analytical PAN: EMI1352AAA Project PAN: EMI1352SAA

The data quality assurance review of 6 soil samples and 3 liquid samples collected from the Jackson Drop Forge site in Jackson, Michigan has been completed. Analysis for **Pesticides** was performed by Environmental Control Technology Corporation of Ann Arbor, Michigan, in accordance with U.S. EPA Method 8080.

The samples were numbered JDF2, JDF3, JDF5, JDF6, JDF8, JDF9, JDF10, JDF11, and JDF12 in the field, and the laboratory numbered the samples 200023375 through 200023383.

Data Qualifications:

I Sample Holding Time: Acceptable.

The unpreserved samples were collected on 10/25/93, extracted on 10/27/93 (samples JDF10-12 were extracted on 10/28/93, and analzed on 10/29/93. The holding time criteria of 7 days for water and 14 days for soils from collection to extraction was satisfied. The analysis of the samples was completed within the 40 day holding time requirement after extraction.

II Instrument Performance: Acceptable.

The quality control criteria established for the retention time shift of less than .3% on a capillary column were acceptable. Peak resolution was greater than 25%. The retention time of DDT met quality control criteria of greater than 12 minutes on the standard chromatogram. Adequate resolution of greater than 25% between peaks of other pesticide compounds was satifactory. The percent breakdown for

endrin and 4,4'-DDT did not exceed 20% in the evaluation standard mix B analysis.

III Calibration: Qualified.

A. Initial Calibration:

A 3-point calibration check was performed prior to sample analysis. The Relative Standard Deviations (RSDs) of all calibration factors for aldrin, endrin, DBC, and DDT met quality control criteria of less than or equal to 10%.

B. Continuing Calibration:

The percent difference (%D) requirements of less than 20% on the confirmation column were acceptable for all data, except endrin aldehyde (29), g-chlordane (891), 4,4'-DDT (55), heptachlor (32), endosulfan sulfate (48), and 4,4'-DDD (28). These data have been qaulified estimated (J) because quality control criteria were not met.

IV Method Blanks: Acceptable.

A method blank was analyzed with the samples. No contaminants were detected above the instrument detection limit.

V Compound Identification: Acceptable.

Positive identification of the retention times of the samples versus the standards have been confirmed on the GC/MS columns.

VI Optional Additional QC: Acceptable.

Surrogate Recovery:

The 2,4,5,6-Tetrachloromethoxy (TCMX) recovery limit of 50-150% were satisfied.

Laboratory Control Sample Analysis:

The quality control criteria provided by the laboratory were met for the control sample.

VII Overall Assessment of Data for Use

The overall usefulness of the data is based on the criteria outlined in "Quality Assurance/Quality Control Guidance For Removal Activities" (OSWER Directive 9360.4-01, April 1990).

Based upon the information provided, the data are acceptable for use with the above stated data qualifications.

Data Qualifiers and Definitions

J - The associated numerical value is an estimated quantity because the reported concentrations were less than the contract required detection limits or quality control criteria were not met.

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ORGANIC ANALYSIS DATA SUMMARY SHEET

Project Name: Ecology & Environment
Project Number: 71152
Method: 8080
Report Date: November 05, 1993

Sample I.D.: JFD 2
Sample Date: 10/25/93
Date Received: 10/27/93
Date Extracted: 10/27/93
Date Analyzed: 10/29/93
ENCOTEC I.D.: 200023375
QC Set I.D.: MPS102793-1

U = Analyte not detected
B = Analyte present in method blank

PRIORITY POLLUTANT LIST CHLORINATED PESTICIDES/PCBs	**CAS NUMBER**	**CONC.** (ug/Kg)	**DETECTION LIMIT** (ug/Kg)
Aldrin	309-00-2	U	190
alpha-BHC	319-84-6	U	190
beta-BHC	319-85-7	U	190
delta-BHC	319-86-8	U	190
gamma-BHC (Lindane)	58-89-9	U	190
Chlordane	57-74-9	U	1,900 J
4,4'-DDD	72-54-8	U	380 J
4,4'-DDE	72-55-9	U	380
4,4'-DDT	50-29-3	U	380 J
Dieldrin	60-57-1	U	380
alpha-Endosulfan	959-98-8	U	190
beta-Endosulfan	33213-65-9	U	380
Endosulfan sulfate	1031-07-08	U	380 J
Endrin	72-20-8	U	380
Endrin aldehyde	7421-93-4	U	380 J
Heptachlor	76-44-8	U	190 J
Heptachlor epoxide	1024-57-3	U	190
Toxaphene	8001-35-2	U	3,800
PCB-1016	12674-11-2	U	1,900
PCB-1221	11104-28-2	U	1,900
PCB-1232	11141-16-5	U	1,900
PCB-1242	53469-21-9	U	1,900
PCB-1248	12672-29-6	U	1,900
PCB-1254	11097-69-1	U	1,900
PCB-1260	11096-82-5	U	1,900

Analysis reported on a ____ WET __X__ DRY weight basis.

Percent solids __63.0__

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ORGANIC ANALYSIS DATA SUMMARY SHEET

Project Name: Ecology & Environment
Project Number: 71152
Method: 8080
Report Date: November 05, 1993

Sample I.D.: JFD 3
Sample Date: 10/25/93
Date Received: 10/27/93
Date Extracted: 10/27/93
Date Analyzed: 10/29/93
ENCOTEC I.D.: 200023376
QC Set I.D.: MPS102793-1

U = Analyte not detected
B = Analyte present in method blank

PRIORITY POLLUTANT LIST CHLORINATED PESTICIDES/PCBs	**CAS NUMBER**	**CONC.** (ug/Kg)	**DETECTION LIMIT** (ug/Kg)
Aldrin	309-00-2	U	150
alpha-BHC	319-84-6	U	150
beta-BHC	319-85-7	U	150
delta-BHC	319-86-8	U	150
gamma-BHC (Lindane)	58-89-9	U	150
Chlordane	57-74-9	U	1,500 J
4,4'-DDD	72-54-8	U	290 J
4,4'-DDE	72-55-9	U	290
4,4'-DDT	50-29-3	U	290 J
Dieldrin	60-57-1	U	290
alpha-Endosulfan	959-98-8	U	150
beta-Endosulfan	33213-65-9	U	290
Endosulfan sulfate	1031-07-08	U	290 J
Endrin	72-20-8	U	290
Endrin aldehyde	7421-93-4	U	290 J
Heptachlor	76-44-8	U	150 J
Heptachlor epoxide	1024-57-3	U	150
Toxaphene	8001-35-2	U	2,900
PCB-1016	12674-11-2	U	1,500
PCB-1221	11104-28-2	U	1,500
PCB-1232	11141-16-5	U	1,500
PCB-1242	53469-21-9	U	1,500
PCB-1248	12672-29-6	U	1,500
PCB-1254	11097-69-1	U	1,500
PCB-1260	11096-82-5	U	1,500

Analysis reported on a ____ WET __X__ DRY weight basis.

Percent solids __83.4__

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ORGANIC ANALYSIS DATA SUMMARY SHEET

Project Name: Ecology & Environment
Project Number: 71152
Method: 8080
Report Date: November 05, 1993

Sample I.D.: JFD 5
Sample Date: 10/25/93
Date Received: 10/27/93
Date Extracted: 10/27/93
Date Analyzed: 10/29/93
ENCOTEC I.D.: 200023377
QC Set I.D.: MPS102793-1

U = Analyte not detected
B = Analyte present in method blank

PRIORITY POLLUTANT LIST CHLORINATED PESTICIDES/PCBs	CAS NUMBER	CONC. (ug/Kg)	DETECTION LIMIT (ug/Kg)
Aldrin	309-00-2	U	160
alpha-BHC	319-84-6	U	160
beta-BHC	319-85-7	U	160
delta-BHC	319-86-8	U	160
gamma-BHC (Lindane)	58-89-9	U	160
Chlordane	57-74-9	U	1,600 J
4,4'-DDD	72-54-8	U	310 J
4,4'-DDE	72-55-9	U	310
4,4'-DDT	50-29-3	U	310 J
Dieldrin	60-57-1	U	310
alpha-Endosulfan	959-98-8	U	160
beta-Endosulfan	33213-65-9	U	310
Endosulfan sulfate	1031-07-08	U	310 J
Endrin	72-20-8	U	310
Endrin aldehyde	7421-93-4	U	310 J
Heptachlor	76-44-8	U	160 J
Heptachlor epoxide	1024-57-3	U	160
Toxaphene	8001-35-2	U	3,100
PCB-1016	12674-11-2	U	1,600
PCB-1221	11104-28-2	U	1,600
PCB-1232	11141-16-5	U	1,600
PCB-1242	53469-21-9	U	1,600
PCB-1248	12672-29-6	U	1,600
PCB-1254	11097-69-1	U	1,600
PCB-1260	11096-82-5	U	1,600

Analysis reported on a ____ WET __X__ DRY weight basis.

Percent solids __78.5__

ENVIRONMENTAL CONTROL TECHNOLOGY CORPORATION
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ORGANIC ANALYSIS DATA SUMMARY SHEET

Project Name: Ecology & Environment
Project Number: 71152
Method: 8080
Report Date: November 05, 1993

Sample I.D.: JFD 6
Sample Date: 10/25/93
Date Received: 10/27/93
Date Extracted: 10/27/93
Date Analyzed: 10/29/93
ENCOTEC I.D.: 200023378
QC Set I.D.: MPS102793-1

U = Analyte not detected
B = Analyte present in method blank

PRIORITY POLLUTANT LIST CHLORINATED PESTICIDES/PCBs	**CAS NUMBER**	**CONC.** (ug/Kg)	**DETECTION LIMIT** (ug/Kg)
Aldrin	309-00-2	U	210
alpha-BHC	319-84-6	U	210
beta-BHC	319-85-7	U	210
delta-BHC	319-86-8	U	210
gamma-BHC (Lindane)	58-89-9	U	210
Chlordane	57-74-9	U	2,100 J
4,4'-DDD	72-54-8	U	410 J
4,4'-DDE	72-55-9	U	410
4,4'-DDT	50-29-3	U	410 J
Dieldrin	60-57-1	U	410
alpha-Endosulfan	959-98-8	U	210
beta-Endosulfan	33213-65-9	U	410
Endosulfan sulfate	1031-07-08	U	410 J
Endrin	72-20-8	U	410
Endrin aldehyde	7421-93-4	U	410 J
Heptachlor	76-44-8	U	210 J
Heptachlor epoxide	1024-57-3	U	210
Toxaphene	8001-35-2	U	4,100
PCB-1016	12674-11-2	U	2,100
PCB-1221	11104-28-2	U	2,100
PCB-1232	11141-16-5	U	2,100
PCB-1242	53469-21-9	U	2,100
PCB-1248	12672-29-6	U	2,100
PCB-1254	11097-69-1	U	2,100
PCB-1260	11096-82-5	U	2,100

Analysis reported on a ____ WET __X__ DRY weight basis.

Percent solids __59.3__

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ORGANIC ANALYSIS DATA SUMMARY SHEET

Project Name: Ecology & Environment
Project Number: 71152
Method: 8080
Report Date: November 05, 1993

Sample I.D.: JFD 8
Sample Date: 10/25/93
Date Received: 10/27/93
Date Extracted: 10/27/93
Date Analyzed: 10/29/93
ENCOTEC I.D.: 200023379
QC Set I.D.: MPS102793-1

U = Analyte not detected
B = Analyte present in method blank

PRIORITY POLLUTANT LIST CHLORINATED PESTICIDES/PCBs	CAS NUMBER	CONC. (ug/Kg)	DETECTION LIMIT (ug/Kg)
Aldrin	309-00-2	U	130
alpha-BHC	319-84-6	U	130
beta-BHC	319-85-7	U	130
delta-BHC	319-86-8	U	130
gamma-BHC (Lindane)	58-89-9	U	130
Chlordane	57-74-9	U	1,300 J
4,4'-DDD	72-54-8	U	260 J
4,4'-DDE	72-55-9	U	260
4,4'-DDT	50-29-3	U	260 J
Dieldrin	60-57-1	U	260
alpha-Endosulfan	959-98-8	U	130
beta-Endosulfan	33213-65-9	U	260
Endosulfan sulfate	1031-07-08	U	260 J
Endrin	72-20-8	U	260
Endrin aldehyde	7421-93-4	U	260 J
Heptachlor	76-44-8	U	130 J
Heptachlor epoxide	1024-57-3	U	130
Toxaphene	8001-35-2	U	2,600
PCB-1016	12674-11-2	U	1,300
PCB-1221	11104-28-2	U	1,300
PCB-1232	11141-16-5	U	1,300
PCB-1242	53469-21-9	U	1,300
PCB-1248	12672-29-6	U	1,300
PCB-1254	11097-69-1	U	1,300
PCB-1260	11096-82-5	U	1,300

Analysis reported on a ____ WET __X__ DRY weight basis.

Percent solids __94.3__

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ORGANIC ANALYSIS DATA SUMMARY SHEET

Project Name: Ecology & Environment
Project Number: 71152
Method: 8080
Report Date: November 05, 1993

Sample I.D.: JFD 9
Sample Date: 10/25/93
Date Received: 10/27/93
Date Extracted: 10/27/93
Date Analyzed: 10/29/93
ENCOTEC I.D.: 200023380
QC Set I.D.: MPS102793-1

U = Analyte not detected
B = Analyte present in method blank

PRIORITY POLLUTANT LIST CHLORINATED PESTICIDES/PCBs	CAS NUMBER	CONC. (ug/Kg)	DETECTION LIMIT (ug/Kg)
Aldrin	309-00-2	U	120
alpha-BHC	319-84-6	U	120
beta-BHC	319-85-7	U	120
delta-BHC	319-86-8	U	120
gamma-BHC (Lindane)	58-89-9	U	120
Chlordane	57-74-9	U	1200J
4,4'-DDD	72-54-8	U	240J
4,4'-DDE	72-55-9	U	240
4,4'-DDT	50-29-3	U	240J
Dieldrin	60-57-1	U	240
alpha-Endosulfan	959-98-8	U	120
beta-Endosulfan	33213-65-9	U	240
Endosulfan sulfate	1031-07-08	U	240J
Endrin	72-20-8	U	240
Endrin aldehyde	7421-93-4	U	240J
Heptachlor	76-44-8	U	120J
Heptachlor epoxide	1024-57-3	U	120
Toxaphene	8001-35-2	U	2400
PCB-1016	12674-11-2	U	1200
PCB-1221	11104-28-2	U	1200
PCB-1232	11141-16-5	U	1200
PCB-1242	53469-21-9	U	1200
PCB-1248	12672-29-6	U	1200
PCB-1254	11097-69-1	U	1200
PCB-1260	11096-82-5	U	1200

Analysis reported on a _X_ WET ____ DRY weight basis.

Percent solids __NA__

Form 040CSL1G Rev. 02/24/92

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ORGANIC ANALYSIS DATA SUMMARY SHEET

Project Name: Ecology & Environment
Project Number: 71152
Method: 608___ 8080_X_
Report Date: November 05, 1993

Sample I.D.: JFD 10
Sample Date: 10/25/93
Date Received: 10/27/93
Date Extracted: 10/28/93
Date Analyzed: 10/29/93
ENCOTEC I.D.: 200023381
QC Set I.D.: PW101993-8

U = Analyte not detected
B = Analyte present in method blank

PRIORITY POLLUTANT LIST CHLORINATED PESTICIDES/PCBs	CAS NUMBER	CONC. (ug/L)	DETECTION LIMIT (ug/L)
Aldrin	309-00-2	U	1.0
alpha-BHC	319-84-6	U	1.0
beta-BHC	319-85-7	U	1.0
delta-BHC	319-86-8	U	1.0
gamma-BHC (Lindane)	58-89-9	U	1.0
Chlordane	57-74-9	U	10 J
4,4'-DDD	72-54-8	U	2.0 J
4,4'-DDE	72-55-9	U	2.0
4,4'-DDT	50-29-3	U	2.0 J
Dieldrin	60-57-1	U	2.0
alpha-Endosulfan	959-98-8	U	1.0
beta-Endosulfan	33213-65-9	U	2.0
Endosulfan sulfate	1031-07-08	U	2.0 J
Endrin	72-20-8	U	2.0
Endrin aldehyde	7421-93-4	U	2.0 J
Heptachlor	76-44-8	U	1.0 J
Heptachlor epoxide	1024-57-3	U	1.0
Toxaphene	8001-35-2	U	20
PCB-1016	12674-11-2	U	10
PCB-1221	11104-28-2	U	10
PCB-1232	11141-16-5	U	10
PCB-1242	53469-21-9	U	10
PCB-1248	12672-29-6	U	10
PCB-1254	11097-69-1	U	10
PCB-1260	11096-82-5	U	10

ENVIRONMENTAL CONTROL TECHNOLOGY CORPORATION
3985 Research Park Drive * Ann Arbor, MI 48108
313 / 761-1389

ORGANIC ANALYSIS DATA SUMMARY SHEET

Project Name: Ecology & Environment
Project Number: 71152
Method: 608___ 8080_X_
Report Date: November 05, 1993

Sample I.D.: JFD 11
Sample Date: 10/25/93
Date Received: 10/27/93
Date Extracted: 10/28/93
Date Analyzed: 10/29/93
ENCOTEC I.D.: 200023382
QC Set I.D.: PW101993-8

U = Analyte not detected
B = Analyte present in method blank

PRIORITY POLLUTANT LIST CHLORINATED PESTICIDES/PCBs	CAS NUMBER	CONC. (ug/L)	DETECTION LIMIT (ug/L)
Aldrin	309-00-2	U	1.0
alpha-BHC	319-84-6	U	1.0
beta-BHC	319-85-7	U	1.0
delta-BHC	319-86-8	U	1.0
gamma-BHC (Lindane)	58-89-9	U	1.0
Chlordane	57-74-9	U	10 J
4,4'-DDD	72-54-8	U	2.0 J
4,4'-DDE	72-55-9	U	2.0
4,4'-DDT	50-29-3	U	2.0 J
Dieldrin	60-57-1	U	2.0
alpha-Endosulfan	959-98-8	U	1.0
beta-Endosulfan	33213-65-9	U	2.0
Endosulfan sulfate	1031-07-08	U	2.0 J
Endrin	72-20-8	U	2.0
Endrin aldehyde	7421-93-4	U	2.0 J
Heptachlor	76-44-8	U	1.0 J
Heptachlor epoxide	1024-57-3	U	1.0
Toxaphene	8001-35-2	U	20
PCB-1016	12674-11-2	U	10
PCB-1221	11104-28-2	U	10
PCB-1232	11141-16-5	U	10
PCB-1242	53469-21-9	U	10
PCB-1248	12672-29-6	U	10
PCB-1254	11097-69-1	U	10
PCB-1260	11096-82-5	U	10

ENVIRONMENTAL CONTROL TECHNOLOGY CORPORATION
3985 Research Park Drive * Ann Arbor, MI 48108
313 / 761-1389

ORGANIC ANALYSIS DATA SUMMARY SHEET

Project Name: Ecology & Environment
Project Number: 71152
Method: 608___ 8080_X_
Report Date: November 05, 1993

Sample I.D.: JFD 12
Sample Date: 10/25/93
Date Received: 10/27/93
Date Extracted: 10/28/93
Date Analyzed: 10/29/93
ENCOTEC I.D.: 200023383
QC Set I.D.: PW101993-8

U = Analyte not detected
B = Analyte present in method blank

PRIORITY POLLUTANT LIST CHLORINATED PESTICIDES/PCBs	CAS NUMBER	CONC. (ug/L)	DETECTION LIMIT (ug/L)
Aldrin	309-00-2	U	1.0
alpha-BHC	319-84-6	U	1.0
beta-BHC	319-85-7	U	1.0
delta-BHC	319-86-8	U	1.0
gamma-BHC (Lindane)	58-89-9	U	1.0
Chlordane	57-74-9	U	10 J
4,4'-DDD	72-54-8	U	2.0 J
4,4'-DDE	72-55-9	U	2.0
4,4'-DDT	50-29-3	U	2.0 J
Dieldrin	60-57-1	U	2.0
alpha-Endosulfan	959-98-8	U	1.0
beta-Endosulfan	33213-65-9	U	2.0
Endosulfan sulfate	1031-07-08	U	2.0 J
Endrin	72-20-8	U	2.0
Endrin aldehyde	7421-93-4	U	2.0 J
Heptachlor	76-44-8	U	1.0 J
Heptachlor epoxide	1024-57-3	U	1.0
Toxaphene	8001-35-2	U	20
PCB-1016	12674-11-2	U	10
PCB-1221	11104-28-2	U	10
PCB-1232	11141-16-5	U	10
PCB-1242	53469-21-9	U	10
PCB-1248	12672-29-6	U	10
PCB-1254	11097-69-1	U	10
PCB-1260	11096-82-5	U	10

ecology and environment, inc.
111 WEST JACKSON BLVD., CHICAGO, ILLINOIS 60604, TEL. 312-663-9415
International Specialists in the Environment

MEMORANDUM

DATE: December 3, 1993

TO: Ed Lancaster, TAT Project Manager, E & E, Chicago, IL

FROM: Lisa Graczyk, TAT-Chemist, E & E, Chicago, IL

THRU: Lee Ende, TAT-Chemist, E & E, Chicago, IL

SUBJ: **Volatile Organic Quality Assurance Review**, Jackson Drop Forge, Jackson, Michigan

REF: Analytical TDD: T05-9310-813 Project TDD: T05-9310-011
Analytical PAN: EMI1352AAA Project PAN: EMI1352SAA

The data quality assurance review of 9 waste and soil samples collected from the Jackson Drop Forge site in Jackson, Michigan has been completed. Analysis for volatile organics (U.S. EPA method 8240) was performed by Environmental Control Technology Corporation (ENCOTEC) in Ann Arbor, Michigan.

The samples were numbered: JDF2, JDF3, JDF5, JDF6, and JDF8 to JDF12 by field personnel and 200023375 to 200023383 by the laboratory respectively.

Data Qualifications:

I Sample Holding Time: Acceptable.

All samples were collected on 10-25-93. Samples JDF2, JDF3, and JDF8 to JDF12 were analyzed on 10/29/93. Sample JDF3 was analyzed on 11/01/93. Sample JDF5 was analyzed on 11/02/93. All samples meet the holding time requirement of 14 days.

II GC/MS Tuning: Acceptable.

Bromofluorobenzene (BFB) was run for every 12 hours of sample analyses. The ion abundance criteria was met.

III Initial and Continuing Calibration: Qualified.

No compounds have an average response factor equal to 0. All volatile compounds have a relative response factor of at least 0.05. All compounds have a percent relative standard deviation of less than or equal to the 30% control limit for the initial calibration.

The percent differences between the continuing calibration relative response factors(RRFs) and the initial calibration's RRFs were less than or equal to the 25% control limit except for the following:

	Compound	%D	
10/29/93:	acetonitrile	51.4	
	chloromethane	35.5	
	bromomethane	59.4	
	vinyl chloride	49.2	
	chlorethane	49.9	
	1,2-dichloropropane	29.3	
	toluene	43.2	
	dichlorodifluoromethane	43.2	
11/01/93:	bromomethane	73.0	
	vinyl chloride	37.3	
	chloroethane	40.4	
	1,1-dichloroethane	27.1	
	1,2-dichloropropane	29.3	
	benzene	26.0	
	trans-1,3-dichloropropene		38.8
	1,1,2,2-tetrachlorethane		26.6
	toluene	51.3	
	dichlorodifluoromethane	42.0	
11/02/93:	acetonitrile	42.3	
	bromomethane	71.3	
	vinyl chloride	39.1	
	chloroethane	34.7	
	1,2-dichloropropane	39.0	
	trans-1,3-dichloropropene		39.0
	toluene	50.4	
	dichlorodifluoromethane		50.9

The associated compounds will be flagged as estimated (J).

IV. Internal Standards: Qualified.

Retention times for internal standards are acceptable. Internal standard areas are inside control limits of -50% to +100% of the associated standard except for the internal standards run on 11/02/93. Only JDF5 was analyzed on this date. All positive results for this sample will be flagged as estimated (J).

V. Matrix Spike/ Matrix Spike Duplicate: Not analyzed.

This is optional for QA Level II analyses.

VI. Blanks: Acceptable.

A method blank was analyzed with each set of samples. All blanks were below the required detection limits.

VII. Compound Identification: Acceptable.

The relative retention times(RRTs) of identified compounds in samples were within 0.06 RRT units of the standard RRTs.

VIII Overall Assessment of Data for Use

The overall usefulness of the data is based on the criteria outlined in "Quality Assurance/Quality Control Guidance for Removal Activities (OSWER Directive 9360.4-01, April 1990)".

Based upon the information provided, the data are acceptable for use with the above stated data qualifications.

Definitions of Data Validation Qualifiers

J - The associated numerical value is an estimated quantity because the reported concentrations were less than the required detection limits or quality control criteria were not met.

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

JDF2

Lab Name: ENCOTEC Contract: 71152

Lab Code: ENCOT Case No.: 3928 SAS No.: SDG No.: 23372

Matrix: (soil/water) SOIL Lab Sample ID: 23375VR

Sample wt/vol: 4.0 (g/mL) G Lab File ID: 23375VR

Level: (low/med) MED Date Received: 10/27/93

% Moisture: not dec. 37 Date Analyzed: 10/29/93

GC Column: CAP ID: 0.530 (mm) Dilution Factor: 4000

Soil Extract Volume: 10000 (uL) Soil Aliquot Volume: 100 (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
110-75-8	2-Chloroethyl vinyl ether	7600000	U
75-05-8	Acetonitrile	7600000	U
107-02-8	Acrolein	7600000	U
107-13-1	Acrylonitrile	7600000	U
74-87-3	Chloromethane	7600000	U
74-83-9	Bromomethane	7600000	U
75-01-4	Vinyl Chloride	7600000	U
75-00-3	Chloroethane	7600000	U
75-09-2	Methylene Chloride	7600000	U
75-35-4	1,1-Dichloroethene	7600000	U
75-34-3	1,1-Dichloroethane	7600000	U
540-59-0	1,2-Dichloroethene (total)	7600000	U
67-66-3	Chloroform	7600000	U
107-06-2	1,2-Dichloroethane	7600000	U
71-55-6	1,1,1-Trichloroethane	7600000	U
56-23-5	Carbon Tetrachloride	7600000	U
75-27-4	Bromodichloromethane	7600000	U
78-87-5	1,2-Dichloropropane	7600000	U
10061-01-5	cis-1,3-Dichloropropene	7600000	U
79-01-6	Trichloroethene	7600000	U
124-48-1	Dibromochloromethane	7600000	U
79-00-5	1,1,2-Trichloroethane	7600000	U
71-43-2	Benzene	7600000	U
10061-02-6	trans-1,3-Dichloropropene	7600000	U
75-25-2	Bromoform	7600000	U
127-18-4	Tetrachloroethene	7600000	U
79-34-5	1,1,2,2-Tetrachloroethane	7600000	U
108-88-3	Toluene	31000000	
108-90-7	Chlorobenzene	7600000	U
100-41-4	Ethylbenzene	22000000	
75-71-8	Dichlorodifluoromethane	7600000	U
75-69-4	Trichlorofluoromethane	7600000	U

1E

EPA SAMPLE NO.

JDF2

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: ENCOTEC Contract: 71152

Lab Code: ENCOT Case No.: 3928 SAS No.: SDG No.: 23372

Matrix: (soil/water) SOIL Lab Sample ID: 23375VR

Sample wt/vol: 4.0 (g/mL) G Lab File ID: 23375VR

Level: (low/med) MED Date Received: 10/27/93

% Moisture: not dec. 37 Date Analyzed: 10/29/93

GC Column: CAP ID: 0.530 (mm) Dilution Factor: 4000

Soil Extract Volume: 10000 (uL) Soil Aliquot Volume: 100 (uL)

Number TICs found: 2 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	95-47-6	O-XYLENE	14.78	36000000	JN
2.		M&P XYLENE	15.70	100000000	JN

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

JDF3

Lab Name: ENCOTEC Contract: 71152

Lab Code: ENCOT Case No.: 3928 SAS No.: SDG No.: 23372

Matrix: (soil/water) SOIL Lab Sample ID: 23376VR1

Sample wt/vol: 4.0 (g/mL) G Lab File ID: 23376VR1

Level: (low/med) MED Date Received: 10/27/93

% Moisture: not dec. 17 Date Analyzed: 11/01/93

GC Column: CAP ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: 10000 (uL) Soil Aliquot Volume: 100 (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
110-75-8	2-Chloroethyl vinyl ether	1400	U
75-05-8	Acetonitrile	1400	U
107-02-8	Acrolein	1400	U
107-13-1	Acrylonitrile	1400	U
74-87-3	Chloromethane	1400	U
74-83-9	Bromomethane	1400	U
75-01-4	Vinyl Chloride	1400	U
75-00-3	Chloroethane	1400	U
75-09-2	Methylene Chloride	500	J
75-35-4	1,1-Dichloroethene	1400	U
75-34-3	1,1-Dichloroethane	1400	U
540-59-0	1,2-Dichloroethene (total)	1400	U
67-66-3	Chloroform	1400	U
107-06-2	1,2-Dichloroethane	1400	U
71-55-6	1,1,1-Trichloroethane	1400	U
56-23-5	Carbon Tetrachloride	1400	U
75-27-4	Bromodichloromethane	1400	U
78-87-5	1,2-Dichloropropane	1400	U
10061-01-5	cis-1,3-Dichloropropene	1400	U
79-01-6	Trichloroethene	1400	U
124-48-1	Dibromochloromethane	1400	U
79-00-5	1,1,2-Trichloroethane	1400	U
71-43-2	Benzene	6900	
10061-02-6	trans-1,3-Dichloropropene	1400	U
75-25-2	Bromoform	1400	U
127-18-4	Tetrachloroethene	1400	U
79-34-5	1,1,2,2-Tetrachloroethane	1400	U
108-88-3	Toluene	1500	
108-90-7	Chlorobenzene	1400	U
100-41-4	Ethylbenzene	210	J
75-71-8	Dichlorodifluoromethane	1400	U
75-69-4	Trichlorofluoromethane	1400	U

1E

EPA SAMPLE NO.

JDF3

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: ENCOTEC Contract: 71152

Lab Code: ENCOT Case No.: 3928 SAS No.: SDG No.: 23372

Matrix: (soil/water) SOIL Lab Sample ID: 23376VR1

Sample wt/vol: 4.0 (g/mL) G Lab File ID: 23376VR1

Level: (low/med) MED Date Received: 10/27/93

% Moisture: not dec. 17 Date Analyzed: 11/01/93

GC Column: CAP ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: 10000 (uL) Soil Aliquot Volume: 100 (uL)

Number TICs found: 10

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN	4.90	500000	J
2.		UNKNOWN ALKANE	5.18	390000	J
3.		UNKNOWN ALKANE	5.50	680000	J
4.		UNKNOWN ALKANE	6.33	860000	J
5.		UNKNOWN	7.30	930000	J
6.		UNKNOWN ALKANE	7.52	920000	J
7.		UNKNOWN	7.87	130000	J
8.		UNKNOWN ALKANE	8.05	150000	J
9.		UNKNOWN ALKANE	8.22	400000	J
10.	108-87-2	METHYL CYCLOHEXANE	9.18	290000	JN

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

JDF5

Lab Name: ENCOTEC Contract: 71152

Lab Code: ENCOT Case No.: 3928 SAS No.: SDG No.: 23372

Matrix: (soil/water) SOIL Lab Sample ID: 23377VR1

Sample wt/vol: 0.5 (g/mL) G Lab File ID: 23377VR1

Level: (low/med) LOW Date Received: 10/27/93

% Moisture: not dec. 22 Date Analyzed: 11/02/93

GC Column: CAP ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
110-75-8	2-Chloroethyl vinyl ether	190	U
75-05-8	Acetonitrile	190	U
107-02-8	Acrolein	190	U
107-13-1	Acrylonitrile	190	U
74-87-3	Chloromethane	130	U
74-83-9	Bromomethane	130	U
75-01-4	Vinyl Chloride	130	U
75-00-3	Chloroethane	130	U
75-09-2	Methylene Chloride	370	B
75-35-4	1,1-Dichloroethene	130	U
75-34-3	1,1-Dichloroethane	130	U
540-59-0	1,2-Dichloroethene (total)	130	U
67-66-3	Chloroform	130	U
107-06-2	1,2-Dichloroethane	130	U
71-55-6	1,1,1-Trichloroethane	130	U
56-23-5	Carbon Tetrachloride	130	U
75-27-4	Bromodichloromethane	130	U
78-87-5	1,2-Dichloropropane	130	U
10061-01-5	cis-1,3-Dichloropropene	130	U
79-01-6	Trichloroethene	130	U
124-48-1	Dibromochloromethane	130	U
79-00-5	1,1,2-Trichloroethane	130	U
71-43-2	Benzene	130	U
10061-02-6	trans-1,3-Dichloropropene	130	U
75-25-2	Bromoform	130	U
127-18-4	Tetrachloroethene	130	U
79-34-5	1,1,2,2-Tetrachloroethane	130	U
108-88-3	Toluene	130	U
108-90-7	Chlorobenzene	130	U
100-41-4	Ethylbenzene	130	U
75-71-8	Dichlorodifluoromethane	190	U
75-69-4	Trichlorofluoromethane	64	U

1E

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

JDF5

Lab Name: ENCOTEC Contract: 71152

Lab Code: ENCOT Case No.: 3928 SAS No.: SDG No.: 23372

Matrix: (soil/water) SOIL Lab Sample ID: 23377VR1

Sample wt/vol: 0.5 (g/mL) G Lab File ID: 23377VR1

Level: (low/med) LOW Date Received: 10/27/93

% Moisture: not dec. 22 Date Analyzed: 11/02/93

GC Column: CAP ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

umber TICs found: 0 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

JDF6

Lab Name: ENCOTEC Contract: 71152

Lab Code: ENCOT Case No.: 3928 SAS No.: SDG No.: 23372

Matrix: (soil/water) SOIL Lab Sample ID: 23378VR

Sample wt/vol: 4.0 (g/mL) G Lab File ID: 23378VR

Level: (low/med) MED Date Received: 10/27/93

% Moisture: not dec. 41 Date Analyzed: 10/29/93

GC Column: CAP ID: 0.530 (mm) Dilution Factor: 10.0

Soil Extract Volume: 10000 (uL) Soil Aliquot Volume: 100 (uL)

Number TICs found: 10 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN ALKANE	11.57	1600000	J
2.		UNKNOWN ALKANE	11.78	270000	J
3.		UNKNOWN ALKANE	12.58	400000	J
4.		UNKNOWN	12.92	360000	J
5.	1678-91-7	ETHYL CYCLOHEXANE	13.03	940000	JN
6.		UNKNOWN	13.17	740000	J
7.		UNKNOWN ALKANE	13.65	550000	J
8.		UNKNOWN ALKANE	13.80	920000	J
9.		UNKNOWN ALKANE	14.07	650000	J
10.		UNKNOWN ALKANE	14.98	2500000	J

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

JDF8

Lab Name: ENCOTEC Contract: 71152

Lab Code: ENCOT Case No.: 3928 SAS No.: SDG No.: 23372

Matrix: (soil/water) SOIL Lab Sample ID: 23379VR

Sample wt/vol: 4.0 (g/mL) G Lab File ID: 23379VR

Level: (low/med) MED Date Received: 10/27/93

% Moisture: not dec. 6 Date Analyzed: 10/29/93

GC Column: CAP ID: 0.530 (mm) Dilution Factor: 100

Soil Extract Volume: 10000 (uL) Soil Aliquot Volume: 100 (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
110-75-8	2-Chloroethyl vinyl ether	130000	U
75-05-8	Acetonitrile	130000	U
107-02-8	Acrolein	130000	U
107-13-1	Acrylonitrile	130000	U
74-87-3	Chloromethane	130000	U
74-83-9	Bromomethane	130000	U
75-01-4	Vinyl Chloride	130000	U
75-00-3	Chloroethane	130000	U
75-09-2	Methylene Chloride	130000	U
75-35-4	1,1-Dichloroethene	130000	U
75-34-3	1,1-Dichloroethane	130000	U
540-59-0	1,2-Dichloroethene (total)	130000	U
67-66-3	Chloroform	130000	U
107-06-2	1,2-Dichloroethane	130000	U
71-55-6	1,1,1-Trichloroethane	130000	U
56-23-5	Carbon Tetrachloride	130000	U
75-27-4	Bromodichloromethane	130000	U
78-87-5	1,2-Dichloropropane	130000	U
10061-01-5	cis-1,3-Dichloropropene	130000	U
79-01-6	Trichloroethene	130000	U
124-48-1	Dibromochloromethane	130000	U
79-00-5	1,1,2-Trichloroethane	130000	U
71-43-2	Benzene	130000	U
10061-02-6	trans-1,3-Dichloropropene	130000	U
75-25-2	Bromoform	130000	U
127-18-4	Tetrachloroethene	130000	U
79-34-5	1,1,2,2-Tetrachloroethane	130000	U
108-88-3	Toluene	170000	
108-90-7	Chlorobenzene	130000	U
100-41-4	Ethylbenzene	410000	
75-71-8	Dichlorodifluoromethane	130000	U
75-69-4	Trichlorofluoromethane	130000	U

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

JDF9

Lab Name: ENCOTEC Contract: 71152

Lab Code: ENCOT Case No.: 3928 SAS No.: SDG No.: 23372

Matrix: (soil/water) SOIL Lab Sample ID: 23380VR

Sample wt/vol: 4.0 (g/mL) G Lab File ID: 23380VR

Level: (low/med) MED Date Received: 10/27/93

% Moisture: not dec. Date Analyzed: 10/29/93

GC Column: CAP ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: 10000 (uL) Soil Aliquot Volume: 100 (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
110-75-8	2-Chloroethyl vinyl ether	60000	U
75-05-8	Acetonitrile	60000	U
107-02-8	Acrolein	60000	U
107-13-1	Acrylonitrile	60000	U
74-87-3	Chloromethane	60000	U
74-83-9	Bromomethane	60000	U
75-01-4	Vinyl Chloride	60000	U
75-00-3	Chloroethane	60000	U
75-09-2	Methylene Chloride	1400000	BE
75-35-4	1,1-Dichloroethene	60000	U
75-34-3	1,1-Dichloroethane	60000	U
540-59-0	1,2-Dichloroethene (total)	60000	U
67-66-3	Chloroform	60000	U
107-06-2	1,2-Dichloroethane	60000	U
71-55-6	1,1,1-Trichloroethane	60000	U
56-23-5	Carbon Tetrachloride	60000	U
75-27-4	Bromodichloromethane	60000	U
78-87-5	1,2-Dichloropropane	60000	U
10061-01-5	cis-1,3-Dichloropropene	60000	U
79-01-6	Trichloroethene	60000	U
124-48-1	Dibromochloromethane	60000	U
79-00-5	1,1,2-Trichloroethane	60000	U
71-43-2	Benzene	60000	U
10061-02-6	trans-1,3-Dichloropropene	60000	U
75-25-2	Bromoform	60000	U
127-18-4	Tetrachloroethene	1100000	
79-34-5	1,1,2,2-Tetrachloroethane	60000	U
108-88-3	Toluene	60000	U
108-90-7	Chlorobenzene	60000	U
100-41-4	Ethylbenzene	60000	U
75-71-8	Dichlorodifluoromethane	60000	U
75-69-4	Trichlorofluoromethane	60000	U

1E

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

JDF9

Lab Name: ENCOTEC Contract: 71152

Lab Code: ENCOT Case No.: 3928 SAS No.: SDG No.: 23372

Matrix: (soil/water) SOIL Lab Sample ID: 23380VR

Sample wt/vol: 4.0 (g/mL) G Lab File ID: 23380VR

Level: (low/med) MED Date Received: 10/27/93

% Moisture: not dec. Date Analyzed: 10/29/93

GC Column: CAP ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: 10000 (uL) Soil Aliquot Volume: 100 (uL)

Number TICs found: 10 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN ALKANE	14.90	270000	J
2.		UNKNOWN ALKANE	15.52	130000	J
3.		UNKNOWN ALKANE	16.07	180000	J
4.	1678-92-8	PROPYL CYCLOHEXANE	16.27	220000	JN
5.		UNKNOWN	17.28	190000	J
6.		UNKNOWN	17.82	89000	J
7.		UNKNOWN	17.97	160000	J
8.	124-18-5	DECANE	18.17	460000	JN
9.		UNKNOWN ALKANE	18.90	140000	J
10.		UNKNOWN ALKANE	19.55	130000	J

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

JDF10

Lab Name: ENCOTEC Contract: 71152

Lab Code: ENCOT Case No.: 3928 SAS No.: SDG No.: 23372

Matrix: (soil/water) WATER Lab Sample ID: 23381VR

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 23381VR

Level: (low/med) LOW Date Received: 10/27/93

% Moisture: not dec. Date Analyzed: 10/29/93

GC Column: CAP ID: 0.530 (mm) Dilution Factor: 10.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
110-75-8	2-Chloroethyl vinyl ether	100	U
75-05-8	Acetonitrile	1000	U
107-02-8	Acrolein	1000	U
107-13-1	Acrylonitrile	1000	U
74-87-3	Chloromethane	100	U
74-83-9	Bromomethane	100	U
75-01-4	Vinyl Chloride	100	U
75-00-3	Chloroethane	100	U
75-09-2	Methylene Chloride	76	B
75-35-4	1,1-Dichloroethene	50	U
75-34-3	1,1-Dichloroethane	50	U
540-59-0	1,2-Dichloroethene (total)	50	U
67-66-3	Chloroform	50	U
107-06-2	1,2-Dichloroethane	50	U
71-55-6	1,1,1-Trichloroethane	50	U
56-23-5	Carbon Tetrachloride	50	U
75-27-4	Bromodichloromethane	50	U
78-87-5	1,2-Dichloropropane	50	U
10061-01-5	cis-1,3-Dichloropropene	50	U
79-01-6	Trichloroethene	50	U
124-48-1	Dibromochloromethane	50	U
79-00-5	1,1,2-Trichloroethane	50	U
71-43-2	Benzene	50	U
10061-02-6	trans-1,3-Dichloropropene	50	U
75-25-2	Bromoform	50	U
127-18-4	Tetrachloroethene	50	U
79-34-5	1,1,2,2-Tetrachloroethane	50	U
108-88-3	Toluene	50	U
108-90-7	Chlorobenzene	50	U
100-41-4	Ethylbenzene	50	U
75-71-8	Dichlorodifluoromethane	100	U
75-69-4	Trichlorofluoromethane	50	U

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

JDF10

Lab Name: ENCOTEC Contract: 71152

Lab Code: ENCOT Case No.: 3928 SAS No.: SDG No.: 23372

Matrix: (soil/water) WATER Lab Sample ID: 23381VR

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 23381VR

Level: (low/med) LOW Date Received: 10/27/93

% Moisture: not dec. Date Analyzed: 10/29/93

GC Column: CAP ID: 0.530 (mm) Dilution Factor: 10.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Number TICs found: 0 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

JDF11

Lab Name: ENCOTEC Contract: 71152

Lab Code: ENCOT Case No.: 3928 SAS No.: SDG No.: 23372

Matrix: (soil/water) WATER Lab Sample ID: 23382VR

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 23382VR

Level: (low/med) LOW Date Received: 10/27/93

% Moisture: not dec. Date Analyzed: 10/29/93

GC Column: CAP ID: 0.530 (mm) Dilution Factor: 10.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
110-75-8	2-Chloroethyl vinyl ether	100	U
75-05-8	Acetonitrile	1000	U
107-02-8	Acrolein	1000	U
107-13-1	Acrylonitrile	1000	U
74-87-3	Chloromethane	100	U
74-83-9	Bromomethane	100	U
75-01-4	Vinyl Chloride	100	U
75-00-3	Chloroethane	100	U
75-09-2	Methylene Chloride	26	BJ
75-35-4	1,1-Dichloroethene	50	U
75-34-3	1,1-Dichloroethane	50	U
540-59-0	1,2-Dichloroethene (total)	50	U
67-66-3	Chloroform	50	U
107-06-2	1,2-Dichloroethane	50	U
71-55-6	1,1,1-Trichloroethane	50	U
56-23-5	Carbon Tetrachloride	50	U
75-27-4	Bromodichloromethane	50	U
78-87-5	1,2-Dichloropropane	50	U
10061-01-5	cis-1,3-Dichloropropene	50	U
79-01-6	Trichloroethene	50	U
124-48-1	Dibromochloromethane	50	U
79-00-5	1,1,2-Trichloroethane	50	U
71-43-2	Benzene	50	U
10061-02-6	trans-1,3-Dichloropropene	50	U
75-25-2	Bromoform	50	U
127-18-4	Tetrachloroethene	50	U
79-34-5	1,1,2,2-Tetrachloroethane	50	U
108-88-3	Toluene	50	U
108-90-7	Chlorobenzene	50	U
100-41-4	Ethylbenzene	50	U
75-71-8	Dichlorodifluoromethane	100	U
75-69-4	Trichlorofluoromethane	50	U

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

JDF11

Lab Name: ENCOTEC Contract: 71152

Lab Code: ENCOT Case No.: 3928 SAS No.: SDG No.: 23372

Matrix: (soil/water) WATER Lab Sample ID: 23382VR

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 23382VR

Level: (low/med) LOW Date Received: 10/27/93

% Moisture: not dec. Date Analyzed: 10/29/93

GC Column: CAP ID: 0.530 (mm) Dilution Factor: 10.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

umber TICs found: 0 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

JDF12

Lab Name: ENCOTEC Contract: 71152

Lab Code: ENCOT Case No.: 3928 SAS No.: SDG No.: 23372

Matrix: (soil/water) WATER Lab Sample ID: 23383VR

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 23383VR

Level: (low/med) LOW Date Received: 10/27/93

% Moisture: not dec. Date Analyzed: 10/29/93

GC Column: CAP ID: 0.530 (mm) Dilution Factor: 10000.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
110-75-8	2-Chloroethyl vinyl ether	100000	U
75-05-8	Acetonitrile	1000000	U
107-02-8	Acrolein	1000000	U
107-13-1	Acrylonitrile	1000000	U
74-87-3	Chloromethane	100000	U
74-83-9	Bromomethane	100000	U
75-01-4	Vinyl Chloride	100000	U
75-00-3	Chloroethane	100000	U
75-09-2	Methylene Chloride	50000	U
75-35-4	1,1-Dichloroethene	50000	U
75-34-3	1,1-Dichloroethane	50000	U
540-59-0	1,2-Dichloroethene (total)	50000	U
67-66-3	Chloroform	50000	U
107-06-2	1,2-Dichloroethane	50000	U
71-55-6	1,1,1-Trichloroethane	50000	U
56-23-5	Carbon Tetrachloride	50000	U
75-27-4	Bromodichloromethane	50000	U
78-87-5	1,2-Dichloropropane	50000	U
10061-01-5	cis-1,3-Dichloropropene	50000	U
79-01-6	Trichloroethene	50000	U
124-48-1	Dibromochloromethane	50000	U
79-00-5	1,1,2-Trichloroethane	50000	U
71-43-2	Benzene	50000	U
10061-02-6	trans-1,3-Dichloropropene	50000	U
75-25-2	Bromoform	50000	U
127-18-4	Tetrachloroethene	50000	U
79-34-5	1,1,2,2-Tetrachloroethane	50000	U
108-88-3	Toluene	50000	U
108-90-7	Chlorobenzene	50000	U
100-41-4	Ethylbenzene	50000	U
75-71-8	Dichlorodifluoromethane	100000	U
75-69-4	Trichlorofluoromethane	50000	U

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

JDF12

Lab Name: ENCOTEC Contract: 71152

Lab Code: ENCOT Case No.: 3928 SAS No.: SDG No.: 23372

Matrix: (soil/water) WATER Lab Sample ID: 23383VR

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 23383VR

Level: (low/med) LOW Date Received: 10/27/93

% Moisture: not dec. Date Analyzed: 10/29/93

GC Column: CAP ID: 0.530 (mm) Dilution Factor: 10000.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Number TICs found: 1 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 75-15-0	CARBON DISULFIDE	4.58	9600000	JN

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International Specialists in the Environment

MEMORANDUM

DATE: December 3, 1993

TO: Ed Lancaster, TAT Project Manager, E & E, Chicago, IL

FROM: Lisa Graczyk, TAT-Chemist, E & E, Chicago, IL

THRU: Lee Ende, TAT-Chemist, E & E, Chicago, IL

SUBJ: **Semivolatile Organic Quality Assurance Review**, Jackson Drop Forge, Jackson, Michigan

REF: Analytical TDD: T05-9310-813 Project TDD: T05-9310-011
Analytical PAN: EMI1352AAA Project PAN: EMI1352SAA

The data quality assurance review of 9 waste and soil samples collected from the Jackson Drop Forge site in Jackson, Michigan has been completed. Analysis for semivolatile organics (U.S. EPA method 8270) was performed by Environmental Control Technology Corporation (ENCOTEC) in Ann Arbor, Michigan.

The samples were numbered: JDF2, JDF3, JDF5, JDF6, and JDF8 to JDF12 by field personnel and 200023375 to 200023383 by the laboratory respectively.

Data Qualifications:

I Sample Holding Time: Acceptable.

All samples were collected on 10-25-93. The samples were extracted on 10/27/93 and 10/28/93. Sample JDF6 was analyzed on 10/28/93. Samples JDF8, JDF11, and JDF12 were analyzed on 10/29/93. Samples JDF2, JDF3, JDF5, JDF9, and JDF10 were analyzed on 10/30/93. All samples meet the holding time requirement of 14 days for extraction and 40 days for analysis following extraction.

II GC/MS Tuning: Acceptable.

DFTPP was run for every 12 hours of sample analyses. The ion abundance criteria was met.

III Initial and Continuing Calibration: Qualified.

All semivolatile compounds have a relative response factor of at least 0.05. All compounds have a percent relative standard deviation of less than or equal to the 30% control limit for the initial calibration except for the following:

Compound	%RSD
3,3'-dichlorobenzidine	31.5
dibenz(a,h)antracene	32.8
2,2'-oxybis(1-choropropane)	51.1
pyrene	50.0
indeno(1,2,3-cd)pyrene	40.3
benzo(g,h,i)perylene	38.6

Any positive results for these compounds will be flagged as estimated (J).

The percent differences between the continuing calibration relative response factors(RRFs) and the initial calibration's RRFs were less than or equal to the 25% control limit except for the following:

	Compound	%D
10/28/93:	4-nitrophenol	37.1
10/29/93:	4-nitropenol	27.3
	anthracene	26.7
	ideno(1,2,3-cd)pyrene	64.4
	debenz(a,h)anthracene	45.8
	benzo(g,h,i)perylene	30.5
10/30/93:	hexachlorocyclopentadiene	31.1
	2,4-dinitrophenol	30.9
	di-n-octylphtalate	53.8
	benzo(k)fluoranthene	75.8
	ideno(1,2,3-cd)pyrene	64.4
	dibenz(a,h)anthracene	45.8
	benzo(g,h,i)perylene	30.5

The associated compounds will be flagged as estimated (J).

IV. Internal Standards: Qualified.

Retention times for internal standards are acceptable. Internal standard areas are inside control limits of -50% to +100% of the associated standard except for the internal standards run on 10/28/93 and 10/30/93. The internal standard areas were all lower than the associated standard with the lowest being -64%. All

positive results will be flagged as estimated (J) for samples run on 10/28/93 and 10/30/93.

V. Matrix Spike/ Matrix Spike Duplicate: Not analyzed.

This is optional for QA Level II analyses.

VI. Blanks: Acceptable.

A method blank was analyzed with each set of samples. All blanks were below the required detection limits.

VII Overall Assessment of Data for Use

The overall usefulness of the data is based on the criteria outlined in "Quality Assurance/Quality Control Guidance for Removal Activities (OSWER Directive 9360.4-01, April 1990)".

Based upon the information provided, the data are acceptable for use with the above stated data qualifications.

Definitions of Data Validation Qualifiers

J - The associated numerical value is an estimated quantity because the reported concentrations were less than the required detection limits or quality control criteria were not met.

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

JDF2

Lab Name: ENCOTEC Contract: 71152
Lab Code: ENCOT Case No.: 3928 SAS No.: SDG No.: 23372

Matrix: (soil/water) SOIL Lab Sample ID: 23375B

Sample wt/vol: 1.0 (g/mL) G Lab File ID: 23375B

Level: (low/med) MED Date Received: 10/27/93

% Moisture: 37 decanted: (Y/N) N Date Extracted: 10/27/93

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 10/30/93

Injection Volume: 2.0(uL) Dilution Factor: 5.0

GPC Cleanup: (Y/N) N pH:

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	79000	U
111-44-4	bis(2-Chloroethyl)Ether	79000	U
95-57-8	2-Chlorophenol	79000	U
541-73-1	1,3-Dichlorobenzene	79000	U
106-46-7	1,4-Dichlorobenzene	79000	U
95-50-1	1,2-Dichlorobenzene	79000	U
108-60-1	2,2'-oxybis(1-Chloropropane)	79000	U
621-64-7	N-Nitroso-Di-n-Propylamine	79000	U
67-72-1	Hexachloroethane	79000	U
98-95-3	Nitrobenzene	79000	U
78-59-1	Isophorone	79000	U
88-75-5	2-Nitrophenol	79000	U
105-67-9	2,4-Dimethylphenol	79000	U
111-91-1	bis(2-Chloroethoxy)Methane	79000	U
120-83-2	2,4-Dichlorophenol	79000	U
120-82-1	1,2,4-Trichlorobenzene	79000	U
91-20-3	Naphthalene	79000	U
87-68-3	Hexachlorobutadiene	79000	U
59-50-7	4-Chloro-3-Methylphenol	79000	U
77-47-4	Hexachlorocyclopentadiene	79000	U
88-06-2	2,4,6-Trichlorophenol	79000	U
91-58-7	2-Chloronaphthalene	79000	U
131-11-3	Dimethylphthalate	79000	U
208-96-8	Acenaphthylene	79000	U
606-20-2	2,6-Dinitrotoluene	79000	U
83-32-9	Acenaphthene	79000	U
51-28-5	2,4-Dinitrophenol	200000	U
100-02-7	4-Nitrophenol	200000	U
121-14-2	2,4-Dinitrotoluene	79000	U
84-66-2	Diethylphthalate	79000	U
7005-72-3	4-Chlorophenyl-phenylether	79000	U
86-73-7	Fluorene	79000	U
534-52-1	4,6-Dinitro-2-Methylphenol	200000	U

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

JDF2

Lab Name: ENCOTEC Contract: 71152

Lab Code: ENCOT Case No.: 3928 SAS No.: SDG No.: 23372

Matrix: (soil/water) SOIL Lab Sample ID: 23375B

Sample wt/vol: 1.0 (g/mL) G Lab File ID: 23375B

Level: (low/med) MED Date Received: 10/27/93

% Moisture: 37 decanted: (Y/N) N Date Extracted: 10/27/93

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 10/30/93

Injection Volume: 2.0(uL) Dilution Factor: 5.0

GPC Cleanup: (Y/N) N pH:

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
86-30-6	N-Nitrosodiphenylamine (1)	79000	U
101-55-3	4-Bromophenyl-phenylether	79000	U
118-74-1	Hexachlorobenzene	79000	U
87-86-5	Pentachlorophenol	200000	U
85-01-8	Phenanthrene	98000	
120-12-7	Anthracene	11000	J
84-74-2	Di-n-Butylphthalate	79000	U
206-44-0	Fluoranthene	27000	J
92-87-5	Benzidine	760000	U
129-00-0	Pyrene	450000	
85-68-7	Butylbenzylphthalate	79000	U
91-94-1	3,3'-Dichlorobenzidine	79000	U
56-55-3	Benzo(A) anthracene	160000	
218-01-9	Chrysene	350000	
117-81-7	bis(2-Ethylhexyl)Phthalate	79000	U
117-84-0	Di-n-Octylphthalate	79000	U
205-99-2	Benzo(b)Fluoranthene	59000	J
207-08-9	Benzo(k)Fluoranthene	310000	
50-32-8	Benzo(a)Pyrene	250000	
193-39-5	Indeno(1,2,3-cd)Pyrene	49000	J
53-70-3	Dibenz(a,h)Anthracene	79000	U
191-24-2	Benzo(g,h,i)Perylene	79000	U

(1) - Cannot be separated from Diphenylamine

1F

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

JDF2

Lab Name: ENCOTEC Contract: 71152

Lab Code: ENCOT Case No.: 3928 SAS No.: SDG No.: 23372

Matrix: (soil/water) SOIL Lab Sample ID: 23375B

Sample wt/vol: 1.0 (g/mL) G Lab File ID: 23375B

Level: (low/med) MED Date Received: 10/27/93

% Moisture: 37 decanted: (Y/N) N Date Extracted: 10/27/93

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 10/30/93

Injection Volume: 2.0(uL) Dilution Factor: 5.0

GPC Cleanup: (Y/N) N pH:

Number TICs found: 20

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN ALKYL BENZENE	5.00	520000	J
2.		UNKNOWN ALKYL BENZENE	5.80	370000	J
3.		UNKNOWN ALKYL BENZENE	6.05	640000	J
4.		UNKNOWN ALKYL BENZENE	6.22	88000	J
5.		UNKNOWN ALKYL BENZENE	6.48	72000	J
6.		UNKNOWN	7.73	75000	J
7.		UNKNOWN POLYNUCLEAR AROMATIC	22.60	120000	J
8.		UNKNOWN POLYNUCLEAR AROMATIC	24.10	54000	J
9.		UNKNOWN POLYNUCLEAR AROMATIC	24.33	82000	J
10.		UNKNOWN POLYNUCLEAR AROMATIC	25.80	140000	J
11.		UNKNOWN POLYNUCLEAR AROMATIC	26.70	410000	J
12.		UNKNOWN POLYNUCLEAR AROMATIC	26.97	330000	J
13.		UNKNOWN POLYNUCLEAR AROMATIC	27.03	260000	J
14.		UNKNOWN POLYNUCLEAR AROMATIC	28.28	150000	J
15.		UNKNOWN POLYNUCLEAR AROMATIC	29.57	50000	J
16.		UNKNOWN POLYNUCLEAR AROMATIC	30.42	260000	J
17.		UNKNOWN POLYNUCLEAR AROMATIC	30.50	140000	J
18.		UNKNOWN	31.60	600000	J
19.		UNKNOWN	31.98	280000	J
20.		UNKNOWN POLYNUCLEAR AROMATIC	34.05	350000	J

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

JDF3

Lab Name: ENCOTEC Contract: 71152
Lab Code: ENCOT Case No.: 3928 SAS No.: SDG No.: 23372

Matrix: (soil/water) SOIL Lab Sample ID: 23376B

Sample wt/vol: 1.0 (g/mL) G Lab File ID: 23376B

Level: (low/med) MED Date Received: 10/27/93

% Moisture: 17 decanted: (Y/N) N Date Extracted: 10/27/93

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 10/30/93

Injection Volume: 2.0(uL) Dilution Factor: 5.0

GPC Cleanup: (Y/N) N pH:

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	60000	U
111-44-4	bis(2-Chloroethyl)Ether	60000	U
95-57-8	2-Chlorophenol	60000	U
541-73-1	1,3-Dichlorobenzene	60000	U
106-46-7	1,4-Dichlorobenzene	60000	U
95-50-1	1,2-Dichlorobenzene	60000	U
108-60-1	2,2'-oxybis(1-Chloropropane)	60000	U
621-64-7	N-Nitroso-Di-n-Propylamine	60000	U
67-72-1	Hexachloroethane	60000	U
98-95-3	Nitrobenzene	60000	U
78-59-1	Isophorone	60000	U
88-75-5	2-Nitrophenol	60000	U
105-67-9	2,4-Dimethylphenol	60000	U
111-91-1	bis(2-Chloroethoxy)Methane	60000	U
120-83-2	2,4-Dichlorophenol	60000	U
120-82-1	1,2,4-Trichlorobenzene	60000	U
91-20-3	Naphthalene	60000	U
87-68-3	Hexachlorobutadiene	60000	U
59-50-7	4-Chloro-3-Methylphenol	60000	U
77-47-4	Hexachlorocyclopentadiene	60000	U
88-06-2	2,4,6-Trichlorophenol	60000	U
91-58-7	2-Chloronaphthalene	60000	U
131-11-3	Dimethylphthalate	60000	U
208-96-8	Acenaphthylene	60000	U
606-20-2	2,6-Dinitrotoluene	60000	U
83-32-9	Acenaphthene	60000	U
51-28-5	2,4-Dinitrophenol	150000	U
100-02-7	4-Nitrophenol	150000	U
121-14-2	2,4-Dinitrotoluene	60000	U
84-66-2	Diethylphthalate	60000	U
7005-72-3	4-Chlorophenyl-phenylether	60000	U
86-73-7	Fluorene	60000	U
534-52-1	4,6-Dinitro-2-Methylphenol	150000	U

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

JDF3

Lab Name: ENCOTEC Contract: 71152

Lab Code: ENCOT Case No.: 3928 SAS No.: SDG No.: 23372

Matrix: (soil/water) SOIL Lab Sample ID: 23376B

Sample wt/vol: 1.0 (g/mL) G Lab File ID: 23376B

Level: (low/med) MED Date Received: 10/27/93

% Moisture: 17 decanted: (Y/N) N Date Extracted: 10/27/93

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 10/30/93

Injection Volume: 2.0(uL) Dilution Factor: 5.0

GPC Cleanup: (Y/N) N pH:

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
86-30-6	N-Nitrosodiphenylamine (1)	60000	U
101-55-3	4-Bromophenyl-phenylether	60000	U
118-74-1	Hexachlorobenzene	60000	U
87-86-5	Pentachlorophenol	150000	U
85-01-8	Phenanthrene	60000	U
120-12-7	Anthracene	60000	U
84-74-2	Di-n-Butylphthalate	60000	U
206-44-0	Fluoranthene	60000	U
92-87-5	Benzidine	580000	U
129-00-0	Pyrene	60000	U
85-68-7	Butylbenzylphthalate	60000	U
91-94-1	3,3'-Dichlorobenzidine	60000	U
56-55-3	Benzo(A) anthracene	60000	U
218-01-9	Chrysene	60000	U
117-81-7	bis(2-Ethylhexyl)Phthalate	60000	U
117-84-0	Di-n-Octylphthalate	60000	U
205-99-2	Benzo(b)Fluoranthene	60000	U
207-08-9	Benzo(k)Fluoranthene	60000	U
50-32-8	Benzo(a)Pyrene	60000	U
193-39-5	Indeno(1,2,3-cd)Pyrene	60000	U
53-70-3	Dibenz(a,h)Anthracene	60000	U
191-24-2	Benzo(g,h,i)Perylene	60000	U

(1) - Cannot be separated from Diphenylamine

1F

EPA SAMPLE NO.

JDF3

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: ENCOTEC Contract: 71152

Lab Code: ENCOT Case No.: 3928 SAS No.: SDG No.: 23372

Matrix: (soil/water) SOIL Lab Sample ID: 23376B

Sample wt/vol: 1.0 (g/mL) G Lab File ID: 23376B

Level: (low/med) MED Date Received: 10/27/93

% Moisture: 17 decanted: (Y/N) N Date Extracted: 10/27/93

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 10/30/93

Injection Volume: 2.0(uL) Dilution Factor: 5.0

GPC Cleanup: (Y/N) N pH:

Number TICs found: 23 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN	24.18	54000	J
2.		UNKNOWN	24.65	64000	J
3.		UNKNOWN	24.92	61000	J
4.		UNKNOWN	25.28	130000	J
5.		UNKNOWN	25.97	110000	J
6.		UNKNOWN	26.33	160000	J
7.		UNKNOWN	27.33	120000	J
8.		UNKNOWN	27.55	110000	J
9.		UNKNOWN	28.12	110000	J
10.		UNKNOWN	28.28	90000	J
11.		UNKNOWN	28.53	130000	J
12.		UNKNOWN	28.73	180000	J
13.		UNKNOWN	28.85	77000	J
14.		UNKNOWN	29.67	110000	J
15.		UNKNOWN	29.98	74000	J
16.		UNKNOWN	30.73	60000	J
17.		UNKNOWN	30.92	61000	J
18.		UNKNOWN	31.10	69000	J
19.		UNKNOWN	31.62	250000	J
20.		UNKNOWN	31.77	220000	J
21.		UNKNOWN	32.00	280000	J
22.		UNKNOWN	32.13	400000	J
23.		UNKNOWN	33.00	250000	J

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

JDF5

Lab Name: ENCOTEC Contract: 71152
Lab Code: ENCOT Case No.: 3928 SAS No.: SDG No.: 23372

Matrix: (soil/water) SOIL Lab Sample ID: 23377BR

Sample wt/vol: 1.0 (g/mL) G Lab File ID: 23377BR

Level: (low/med) MED Date Received: 10/27/93

% Moisture: 22 decanted: (Y/N) N Date Extracted: 10/27/93

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 10/30/93

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH:

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	13000	U
111-44-4	bis(2-Chloroethyl)Ether	13000	U
95-57-8	2-Chlorophenol	13000	U
541-73-1	1,3-Dichlorobenzene	13000	U
106-46-7	1,4-Dichlorobenzene	13000	U
95-50-1	1,2-Dichlorobenzene	13000	U
108-60-1	2,2'-oxybis(1-Chloropropane)	13000	U
621-64-7	N-Nitroso-Di-n-Propylamine	13000	U
67-72-1	Hexachloroethane	13000	U
98-95-3	Nitrobenzene	13000	U
78-59-1	Isophorone	13000	U
88-75-5	2-Nitrophenol	13000	U
105-67-9	2,4-Dimethylphenol	13000	U
111-91-1	bis(2-Chloroethoxy)Methane	13000	U
120-83-2	2,4-Dichlorophenol	13000	U
120-82-1	1,2,4-Trichlorobenzene	13000	U
91-20-3	Naphthalene	1500	J
87-68-3	Hexachlorobutadiene	13000	U
59-50-7	4-Chloro-3-Methylphenol	13000	U
77-47-4	Hexachlorocyclopentadiene	13000	U
88-06-2	2,4,6-Trichlorophenol	13000	U
91-58-7	2-Chloronaphthalene	13000	U
131-11-3	Dimethylphthalate	13000	U
208-96-8	Acenaphthylene	13000	U
606-20-2	2,6-Dinitrotoluene	13000	U
83-32-9	Acenaphthene	13000	U
51-28-5	2,4-Dinitrophenol	32000	U
100-02-7	4-Nitrophenol	32000	U
121-14-2	2,4-Dinitrotoluene	13000	U
84-66-2	Diethylphthalate	13000	U
7005-72-3	4-Chlorophenyl-phenylether	13000	U
86-73-7	Fluorene	13000	U
534-52-1	4,6-Dinitro-2-Methylphenol	32000	U

1F

EPA SAMPLE NO.

JDF5

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: ENCOTEC Contract: 71152

Lab Code: ENCOT Case No.: 3928 SAS No.: SDG No.: 23372

Matrix: (soil/water) SOIL Lab Sample ID: 23377BR

Sample wt/vol: 1.0 (g/mL) G Lab File ID: 23377BR

Level: (low/med) MED Date Received: 10/27/93

% Moisture: 22 decanted: (Y/N) N Date Extracted: 10/27/93

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 10/30/93

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH:

Number TICs found: 16 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN ALKANE	12.67	28000	J
2.		UNKNOWN ALKANE	12.98	85000	J
3.		UNKNOWN	13.12	60000	J
4.		UNKNOWN	15.78	62000	J
5.		UNKNOWN	16.17	210000	J
6.		UNKNOWN	19.05	9400	J
7.		UNKNOWN	21.23	12000	J
8.		UNKNOWN SILOXANE	23.20	13000	J
9.		UNKNOWN SILOXANE	25.00	74000	J
10.		UNKNOWN ALKANE	25.70	64000	J
11.		UNKNOWN SILOXANE	26.67	87000	J
12.		UNKNOWN	27.88	20000	J
13.		UNKNOWN SILOXANE	28.25	91000	J
14.		UNKNOWN SILOXANE	29.78	88000	J
15.		UNKNOWN SILOXANE	31.35	45000	J
16.		UNKNOWN SILOXANE	33.03	15000	J

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

JDF5RE

Lab Name: ENCOTEC Contract: 71152
Lab Code: ENCOT Case No.: 3928 SAS No.: SDG No.: 23372

Matrix: (soil/water) SOIL Lab Sample ID: 23377BR1

Sample wt/vol: 1.0 (g/mL) G Lab File ID: 23377BR1

Level: (low/med) MED Date Received: 10/27/93

% Moisture: 22 decanted: (Y/N) N Date Extracted: 10/27/93

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 11/01/93

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH:

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	13000	U
111-44-4	bis(2-Chloroethyl)Ether	13000	U
95-57-8	2-Chlorophenol	13000	U
541-73-1	1,3-Dichlorobenzene	13000	U
106-46-7	1,4-Dichlorobenzene	13000	U
95-50-1	1,2-Dichlorobenzene	13000	U
108-60-1	2,2'-oxybis(1-Chloropropane)	13000	U
621-64-7	N-Nitroso-Di-n-Propylamine	13000	U
67-72-1	Hexachloroethane	13000	U
98-95-3	Nitrobenzene	13000	U
78-59-1	Isophorone	13000	U
88-75-5	2-Nitrophenol	13000	U
105-67-9	2,4-Dimethylphenol	13000	U
111-91-1	bis(2-Chloroethoxy)Methane	13000	U
120-83-2	2,4-Dichlorophenol	13000	U
120-82-1	1,2,4-Trichlorobenzene	13000	U
91-20-3	Naphthalene	1800	J
87-68-3	Hexachlorobutadiene	13000	U
59-50-7	4-Chloro-3-Methylphenol	13000	U
77-47-4	Hexachlorocyclopentadiene	13000	U
88-06-2	2,4,6-Trichlorophenol	13000	U
91-58-7	2-Chloronaphthalene	13000	U
131-11-3	Dimethylphthalate	13000	U
208-96-8	Acenaphthylene	13000	U
606-20-2	2,6-Dinitrotoluene	13000	U
83-32-9	Acenaphthene	13000	U
51-28-5	2,4-Dinitrophenol	32000	U
100-02-7	4-Nitrophenol	32000	U
121-14-2	2,4-Dinitrotoluene	13000	U
84-66-2	Diethylphthalate	13000	U
7005-72-3	4-Chlorophenyl-phenylether	13000	U
86-73-7	Fluorene	13000	U
534-52-1	4,6-Dinitro-2-Methylphenol	32000	U

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

JDF5RE

Lab Name: ENCOTEC Contract: 71152

Lab Code: ENCOT Case No.: 3928 SAS No.: SDG No.: 23372

Matrix: (soil/water) SOIL Lab Sample ID: 23377BR1

Sample wt/vol: 1.0 (g/mL) G Lab File ID: 23377BR1

Level: (low/med) MED Date Received: 10/27/93

% Moisture: 22 decanted: (Y/N) N Date Extracted: 10/27/93

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 11/01/93

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH:

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
86-30-6	N-Nitrosodiphenylamine (1)	13000	U
101-55-3	4-Bromophenyl-phenylether	13000	U
118-74-1	Hexachlorobenzene	13000	U
87-86-5	Pentachlorophenol	32000	U
85-01-8	Phenanthrene	13000	U
120-12-7	Anthracene	13000	U
84-74-2	Di-n-Butylphthalate	3400	J
206-44-0	Fluoranthene	13000	U
92-87-5	Benzidine	120000	U
129-00-0	Pyrene	13000	U
85-68-7	Butylbenzylphthalate	13000	U
91-94-1	3,3'-Dichlorobenzidine	13000	U
56-55-3	Benzo(A) anthracene	13000	U
218-01-9	Chrysene	13000	U
117-81-7	bis(2-Ethylhexyl)Phthalate	10000	J
117-84-0	Di-n-Octylphthalate	13000	U
205-99-2	Benzo(b)Fluoranthene	13000	U
207-08-9	Benzo(k)Fluoranthene	13000	U
50-32-8	Benzo(a)Pyrene	13000	U
193-39-5	Indeno(1,2,3-cd)Pyrene	13000	U
53-70-3	Dibenz(a,h)Anthracene	13000	U
191-24-2	Benzo(g,h,i)Perylene	13000	U

(1) - Cannot be separated from Diphenylamine

1F

EPA SAMPLE NO.

JDF5RE

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: ENCOTEC Contract: 71152

Lab Code: ENCOT Case No.: 3928 SAS No.: SDG No.: 23372

Matrix: (soil/water) SOIL Lab Sample ID: 23377BR1

Sample wt/vol: 1.0 (g/mL) G Lab File ID: 23377BR1

Level: (low/med) MED Date Received: 10/27/93

% Moisture: 22 decanted: (Y/N) N Date Extracted: 10/27/93

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 11/01/93

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH:

Number TICs found: 16

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN ALKANE	12.58	27000	J
2.		UNKNOWN	12.90	83000	J
3.		UNKNOWN	13.02	47000	J
4.		UNKNOWN	15.68	53000	J
5.		UNKNOWN	16.07	200000	J
6.		UNKNOWN	16.48	8300	J
7.		UNKNOWN SILOXANE	18.97	14000	J
8.		UNKNOWN SILOXANE	21.15	13000	J
9.		UNKNOWN SILOXANE	23.10	12000	J
10.		UNKNOWN SILOXANE	24.90	11000	J
11.		UNKNOWN ALKANE	25.58	13000	J
12.		UNKNOWN SILOXANE	26.57	12000	J
13.		UNKNOWN ORGANIC ACID	27.73	5200	J
14.		UNKNOWN SILOXANE	29.63	13000	J
15.		UNKNOWN SILOXANE	31.15	7900	J
16.		UNKNOWN SILOXANE	32.78	3000	J

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

JDF6

Lab Name: ENCOTEC Contract: 71152
Lab Code: ENCOT Case No.: 3928 SAS No.: SDG No.: 23372

Matrix: (soil/water) SOIL Lab Sample ID: 23378BR

Sample wt/vol: 1.0 (g/mL) G Lab File ID: 23378B

Level: (low/med) MED Date Received: 10/27/93

% Moisture: 41 decanted: (Y/N) N Date Extracted: 10/27/93

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 10/28/93

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH:

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	17000	U
111-44-4	bis(2-Chloroethyl)Ether	17000	U
95-57-8	2-Chlorophenol	17000	U
541-73-1	1,3-Dichlorobenzene	17000	U
106-46-7	1,4-Dichlorobenzene	17000	U
95-50-1	1,2-Dichlorobenzene	17000	U
108-60-1	2,2'-oxybis(1-Chloropropane)	17000	U
621-64-7	N-Nitroso-Di-n-Propylamine	17000	U
67-72-1	Hexachloroethane	17000	U
98-95-3	Nitrobenzene	17000	U
78-59-1	Isophorone	17000	U
88-75-5	2-Nitrophenol	17000	U
105-67-9	2,4-Dimethylphenol	17000	U
111-91-1	bis(2-Chloroethoxy)Methane	17000	U
120-83-2	2,4-Dichlorophenol	17000	U
120-82-1	1,2,4-Trichlorobenzene	17000	U
91-20-3	Naphthalene	17000	U
87-68-3	Hexachlorobutadiene	17000	U
59-50-7	4-Chloro-3-Methylphenol	17000	U
77-47-4	Hexachlorocyclopentadiene	17000	U
88-06-2	2,4,6-Trichlorophenol	17000	U
91-58-7	2-Chloronaphthalene	17000	U
131-11-3	Dimethylphthalate	17000	U
208-96-8	Acenaphthylene	17000	U
606-20-2	2,6-Dinitrotoluene	17000	U
83-32-9	Acenaphthene	17000	U
51-28-5	2,4-Dinitrophenol	42000	U
100-02-7	4-Nitrophenol	42000	U
121-14-2	2,4-Dinitrotoluene	17000	U
84-66-2	Diethylphthalate	17000	U
7005-72-3	4-Chlorophenyl-phenylether	17000	U
86-73-7	Fluorene	17000	U
534-52-1	4,6-Dinitro-2-Methylphenol	42000	U

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

JDF6

Lab Name: ENCOTEC Contract: 71152

Lab Code: ENCOT Case No.: 3928 SAS No.: SDG No.: 23372

Matrix: (soil/water) SOIL Lab Sample ID: 23378BR

Sample wt/vol: 1.0 (g/mL) G Lab File ID: 23378B

Level: (low/med) MED Date Received: 10/27/93

% Moisture: 41 decanted: (Y/N) N Date Extracted: 10/27/93

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 10/28/93

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH:

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
86-30-6	N-Nitrosodiphenylamine (1)	17000	U
101-55-3	4-Bromophenyl-phenylether	17000	U
118-74-1	Hexachlorobenzene	17000	U
87-86-5	Pentachlorophenol	42000	U
85-01-8	Phenanthrene	17000	U
120-12-7	Anthracene	17000	U
84-74-2	Di-n-Butylphthalate	17000	U
206-44-0	Fluoranthene	17000	U
92-87-5	Benzidine	160000	U
129-00-0	Pyrene	17000	U
85-68-7	Butylbenzylphthalate	17000	U
91-94-1	3,3'-Dichlorobenzidine	17000	U
56-55-3	Benzo(A) anthracene	17000	U
218-01-9	Chrysene	17000	U
117-81-7	bis(2-Ethylhexyl)Phthalate	7900	J
117-84-0	Di-n-Octylphthalate	17000	U
205-99-2	Benzo(b)Fluoranthene	17000	U
207-08-9	Benzo(k)Fluoranthene	17000	U
50-32-8	Benzo(a)Pyrene	17000	U
193-39-5	Indeno(1,2,3-cd)Pyrene	17000	U
53-70-3	Dibenz(a,h)Anthracene	17000	U
191-24-2	Benzo(g,h,i)Perylene	17000	U

(1) - Cannot be separated from Diphenylamine

1B

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

JDF6RE

Lab Name: ENCOTEC Contract: 71152
Lab Code: ENCOT Case No.: 3928 SAS No.: SDG No.: 23372

Matrix: (soil/water) SOIL Lab Sample ID: 23378BR

Sample wt/vol: 1.0 (g/mL) G Lab File ID: 23378BR

Level: (low/med) MED Date Received: 10/27/93

% Moisture: 41 decanted: (Y/N) N Date Extracted: 10/27/93

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 10/30/93

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH:

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	17000	U
111-44-4	bis(2-Chloroethyl)Ether	17000	U
95-57-8	2-Chlorophenol	17000	U
541-73-1	1,3-Dichlorobenzene	17000	U
106-46-7	1,4-Dichlorobenzene	17000	U
95-50-1	1,2-Dichlorobenzene	17000	U
108-60-1	2,2'-oxybis(1-Chloropropane)	17000	U
621-64-7	N-Nitroso-Di-n-Propylamine	17000	U
67-72-1	Hexachloroethane	17000	U
98-95-3	Nitrobenzene	17000	U
78-59-1	Isophorone	17000	U
88-75-5	2-Nitrophenol	17000	U
105-67-9	2,4-Dimethylphenol	17000	U
111-91-1	bis(2-Chloroethoxy)Methane	17000	U
120-83-2	2,4-Dichlorophenol	17000	U
120-82-1	1,2,4-Trichlorobenzene	17000	U
91-20-3	Naphthalene	17000	U
87-68-3	Hexachlorobutadiene	17000	U
59-50-7	4-Chloro-3-Methylphenol	17000	U
77-47-4	Hexachlorocyclopentadiene	17000	U
88-06-2	2,4,6-Trichlorophenol	17000	U
91-58-7	2-Chloronaphthalene	17000	U
131-11-3	Dimethylphthalate	17000	U
208-96-8	Acenaphthylene	17000	U
606-20-2	2,6-Dinitrotoluene	17000	U
83-32-9	Acenaphthene	17000	U
51-28-5	2,4-Dinitrophenol	42000	U
100-02-7	4-Nitrophenol	42000	U
121-14-2	2,4-Dinitrotoluene	17000	U
84-66-2	Diethylphthalate	17000	U
7005-72-3	4-Chlorophenyl-phenylether	17000	U
86-73-7	Fluorene	17000	U
534-52-1	4,6-Dinitro-2-Methylphenol	42000	U

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

JDF6RE

Lab Name: ENCOTEC Contract: 71152

Lab Code: ENCOT Case No.: 3928 SAS No.: SDG No.: 23372

Matrix: (soil/water) SOIL Lab Sample ID: 23378BR

Sample wt/vol: 1.0 (g/mL) G Lab File ID: 23378BR

Level: (low/med) MED Date Received: 10/27/93

% Moisture: 41 decanted: (Y/N) N Date Extracted: 10/27/93

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 10/30/93

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH:

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
86-30-6	N-Nitrosodiphenylamine (1)	17000	U
101-55-3	4-Bromophenyl-phenylether	17000	U
118-74-1	Hexachlorobenzene	17000	U
87-86-5	Pentachlorophenol	42000	U
85-01-8	Phenanthrene	17000	U
120-12-7	Anthracene	17000	U
84-74-2	Di-n-Butylphthalate	3600	J
206-44-0	Fluoranthene	17000	U
92-87-5	Benzidine	160000	U
129-00-0	Pyrene	17000	U
85-68-7	Butylbenzylphthalate	17000	U
91-94-1	3,3'-Dichlorobenzidine	17000	U
56-55-3	Benzo(A) anthracene	17000	U
218-01-9	Chrysene	17000	U
117-81-7	bis(2-Ethylhexyl)Phthalate	8200	J
117-84-0	Di-n-Octylphthalate	17000	U
205-99-2	Benzo(b)Fluoranthene	17000	U
207-08-9	Benzo(k)Fluoranthene	17000	U
50-32-8	Benzo(a)Pyrene	17000	U
193-39-5	Indeno(1,2,3-cd)Pyrene	17000	U
53-70-3	Dibenz(a,h)Anthracene	17000	U
191-24-2	Benzo(g,h,i)Perylene	17000	U

(1) - Cannot be separated from Diphenylamine

1F

EPA SAMPLE NO.

JDF6RE

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: ENCOTEC Contract: 71152

Lab Code: ENCOT Case No.: 3928 SAS No.: SDG No.: 23372

Matrix: (soil/water) SOIL Lab Sample ID: 23378BR

Sample wt/vol: 1.0 (g/mL) G Lab File ID: 23378BR

Level: (low/med) MED Date Received: 10/27/93

% Moisture: 41 decanted: (Y/N) N Date Extracted: 10/27/93

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 10/30/93

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH:

Number TICs found: 21 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN CYCLIC ALKANE	3.87	190000	J
2.		UNKNOWN ALKANE	4.47	600000	J
3.		UNKNOWN	4.67	94000	J
4.		UNKNOWN	4.82	24000	J
5.	1678-92-8	PROPYL CYCLOHEXANE	5.02	100000	JN
6.		UNKNOWN ALKANE	5.13	35000	J
7.		UNKNOWN ALKANE	5.25	31000	J
8.		UNKNOWN ALKANE	5.42	41000	J
9.		UNKNOWN ALKANE	5.77	9300	J
10.		UNKNOWN ALKYL BENZENE	5.85	14000	J
11.		UNKNOWN ALKYL BENZENE	6.02	15000	J
12.		UNKNOWN ALKANE	13.17	15000	J
13.		UNKNOWN ALKANE	14.87	14000	J
14.		UNKNOWN ALKANE	16.47	11000	J
15.		UNKNOWN	22.93	18000	J
16.		UNKNOWN SILOXANE	25.00	29000	J
17.		UNKNOWN SILOXANE	26.65	26000	J
18.		UNKNOWN	27.90	32000	J
19.		UNKNOWN SILOXANE	28.23	39000	J
20.		UNKNOWN SILOXANE	29.77	28000	J
21.		UNKNOWN SILOXANE	31.33	21000	J

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

JDF9

Lab Name: ENCOTEC Contract: 71152
Lab Code: ENCOT Case No.: 3928 SAS No.: SDG No.: 23372

Matrix: (soil/water) SOIL Lab Sample ID: 23380BR1

Sample wt/vol: 1.0 (g/mL) G Lab File ID: 23380BR1

Level: (low/med) MED Date Received: 10/27/93

% Moisture: 0 decanted: (Y/N) N Date Extracted: 10/27/93

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 10/30/93

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH:

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	10000	U
111-44-4	bis(2-Chloroethyl)Ether	10000	U
95-57-8	2-Chlorophenol	10000	U
541-73-1	1,3-Dichlorobenzene	10000	U
106-46-7	1,4-Dichlorobenzene	10000	U
95-50-1	1,2-Dichlorobenzene	10000	U
108-60-1	2,2'-oxybis(1-Chloropropane)	10000	U
621-64-7	N-Nitroso-Di-n-Propylamine	10000	U
67-72-1	Hexachloroethane	10000	U
98-95-3	Nitrobenzene	10000	U
78-59-1	Isophorone	10000	U
88-75-5	2-Nitrophenol	10000	U
105-67-9	2,4-Dimethylphenol	10000	U
111-91-1	bis(2-Chloroethoxy)Methane	10000	U
120-83-2	2,4-Dichlorophenol	10000	U
120-82-1	1,2,4-Trichlorobenzene	10000	U
91-20-3	Naphthalene	6800	J
87-68-3	Hexachlorobutadiene	10000	U
59-50-7	4-Chloro-3-Methylphenol	10000	U
77-47-4	Hexachlorocyclopentadiene	10000	U
88-06-2	2,4,6-Trichlorophenol	10000	U
91-58-7	2-Chloronaphthalene	10000	U
131-11-3	Dimethylphthalate	10000	U
208-96-8	Acenaphthylene	10000	U
606-20-2	2,6-Dinitrotoluene	10000	U
83-32-9	Acenaphthene	10000	U
51-28-5	2,4-Dinitrophenol	25000	U
100-02-7	4-Nitrophenol	25000	U
121-14-2	2,4-Dinitrotoluene	10000	U
84-66-2	Diethylphthalate	10000	U
7005-72-3	4-Chlorophenyl-phenylether	10000	U
86-73-7	Fluorene	10000	U
534-52-1	4,6-Dinitro-2-Methylphenol	25000	U

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

JDF9

Lab Name: ENCOTEC Contract: 71152

Lab Code: ENCOT Case No.: 3928 SAS No.: SDG No.: 23372

Matrix: (soil/water) SOIL Lab Sample ID: 23380BR1

Sample wt/vol: 1.0 (g/mL) G Lab File ID: 23380BR1

Level: (low/med) MED Date Received: 10/27/93

% Moisture: 0 decanted: (Y/N) N Date Extracted: 10/27/93

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 10/30/93

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH:

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
86-30-6	N-Nitrosodiphenylamine (1)	10000	U
101-55-3	4-Bromophenyl-phenylether	10000	U
118-74-1	Hexachlorobenzene	10000	U
87-86-5	Pentachlorophenol	25000	U
85-01-8	Phenanthrene	10000	U
120-12-7	Anthracene	10000	U
84-74-2	Di-n-Butylphthalate	10000	U
206-44-0	Fluoranthene	10000	U
92-87-5	Benzidine	96000	U
129-00-0	Pyrene	10000	U
85-68-7	Butylbenzylphthalate	10000	U
91-94-1	3,3'-Dichlorobenzidine	10000	U
56-55-3	Benzo(A) anthracene	10000	U
218-01-9	Chrysene	10000	U
117-81-7	bis(2-Ethylhexyl)Phthalate	10000	U
117-84-0	Di-n-Octylphthalate	10000	U
205-99-2	Benzo(b)Fluoranthene	10000	U
207-08-9	Benzo(k)Fluoranthene	10000	U
50-32-8	Benzo(a)Pyrene	10000	U
193-39-5	Indeno(1,2,3-cd)Pyrene	10000	U
53-70-3	Dibenz(a,h)Anthracene	10000	U
191-24-2	Benzo(g,h,i)Perylene	10000	U

(1) - Cannot be separated from Diphenylamine

1F

EPA SAMPLE NO.

JDF9

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: ENCOTEC Contract: 71152

Lab Code: ENCOT Case No.: 3928 SAS No.: SDG No.: 23372

Matrix: (soil/water) SOIL Lab Sample ID: 23380BR1

Sample wt/vol: 1.0 (g/mL) G Lab File ID: 23380BR1

Level: (low/med) MED Date Received: 10/27/93

% Moisture: 0 decanted: (Y/N) N Date Extracted: 10/27/93

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 10/30/93

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH:

Number TICs found: 20 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN ALKANE	4.33	270000	J
2.		UNKNOWN ALKANE	5.35	130000	J
3.		UNKNOWN ALKANE	6.23	180000	J
4.		UNKNOWN ALKANE	7.25	840000	J
5.		UNKNOWN	7.52	120000	J
6.		UNKNOWN ALKANE	7.75	370000	J
7.		UNKNOWN	7.82	230000	J
8.		UNKNOWN	7.90	120000	J
9.		UNKNOWN ALKANE	8.05	100000	J
10.		DECAHYDRONAPHTHALENE ISOMER	8.15	130000	J
11.		UNKNOWN ALKANE	8.47	120000	J
12.		UNKNOWN ALKANE	8.62	170000	J
13.		UNKNOWN ALKANE	8.73	170000	J
14.		UNKNOWN ALKANE	9.38	300000	J
15.		UNKNOWN ALKANE	11.38	110000	J
16.	128-37-0	2,6-BIS(1,1-DIMETHYLETHYL)-4	16.77	730000	JN
17.		UNKNOWN ALKANE	18.13	390000	J
18.		UNKNOWN	29.62	320000	J
19.		UNKNOWN	30.13	290000	J
20.		UNKNOWN ALKANE	30.23	300000	J

1B

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

JDF9RE

Lab Name: ENCOTEC Contract: 71152
Lab Code: ENCOT Case No.: 3928 SAS No.: SDG No.: 23372

Matrix: (soil/water) SOIL Lab Sample ID: 23380BR2

Sample wt/vol: 1.0 (g/mL) G Lab File ID: 23380BR2

Level: (low/med) MED Date Received: 10/27/93

% Moisture: 0 decanted: (Y/N) N Date Extracted: 10/27/93

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 11/01/93

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH:

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	10000	U
111-44-4	bis(2-Chloroethyl)Ether	10000	U
95-57-8	2-Chlorophenol	10000	U
541-73-1	1,3-Dichlorobenzene	10000	U
106-46-7	1,4-Dichlorobenzene	10000	U
95-50-1	1,2-Dichlorobenzene	10000	U
108-60-1	2,2'-oxybis(1-Chloropropane)	10000	U
621-64-7	N-Nitroso-Di-n-Propylamine	10000	U
67-72-1	Hexachloroethane	10000	U
98-95-3	Nitrobenzene	10000	U
78-59-1	Isophorone	10000	U
88-75-5	2-Nitrophenol	10000	U
105-67-9	2,4-Dimethylphenol	10000	U
111-91-1	bis(2-Chloroethoxy)Methane	10000	U
120-83-2	2,4-Dichlorophenol	10000	U
120-82-1	1,2,4-Trichlorobenzene	10000	U
91-20-3	Naphthalene	6200	J
87-68-3	Hexachlorobutadiene	10000	U
59-50-7	4-Chloro-3-Methylphenol	10000	U
77-47-4	Hexachlorocyclopentadiene	10000	U
88-06-2	2,4,6-Trichlorophenol	10000	U
91-58-7	2-Chloronaphthalene	10000	U
131-11-3	Dimethylphthalate	10000	U
208-96-8	Acenaphthylene	10000	U
606-20-2	2,6-Dinitrotoluene	10000	U
83-32-9	Acenaphthene	10000	U
51-28-5	2,4-Dinitrophenol	25000	U
100-02-7	4-Nitrophenol	25000	U
121-14-2	2,4-Dinitrotoluene	10000	U
84-66-2	Diethylphthalate	10000	U
7005-72-3	4-Chlorophenyl-phenylether	10000	U
86-73-7	Fluorene	10000	U
534-52-1	4,6-Dinitro-2-Methylphenol	25000	U

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

JDF9RE

Lab Name: ENCOTEC Contract: 71152

Lab Code: ENCOT Case No.: 3928 SAS No.: SDG No.: 23372

Matrix: (soil/water) SOIL Lab Sample ID: 23380BR2

Sample wt/vol: 1.0 (g/mL) G Lab File ID: 23380BR2

Level: (low/med) MED Date Received: 10/27/93

% Moisture: 0 decanted: (Y/N) N Date Extracted: 10/27/93

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 11/01/93

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH:

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
86-30-6	N-Nitrosodiphenylamine (1)	10000	U
101-55-3	4-Bromophenyl-phenylether	10000	U
118-74-1	Hexachlorobenzene	10000	U
87-86-5	Pentachlorophenol	25000	U
85-01-8	Phenanthrene	10000	U
120-12-7	Anthracene	10000	U
84-74-2	Di-n-Butylphthalate	10000	U
206-44-0	Fluoranthene	10000	U
92-87-5	Benzidine	96000	U
129-00-0	Pyrene	10000	U
85-68-7	Butylbenzylphthalate	10000	U
91-94-1	3,3'-Dichlorobenzidine	10000	U
56-55-3	Benzo(A) anthracene	10000	U
218-01-9	Chrysene	10000	U
117-81-7	bis(2-Ethylhexyl)Phthalate	10000	U
117-84-0	Di-n-Octylphthalate	10000	U
205-99-2	Benzo(b)Fluoranthene	10000	U
207-08-9	Benzo(k)Fluoranthene	10000	U
50-32-8	Benzo(a)Pyrene	10000	U
193-39-5	Indeno(1,2,3-cd)Pyrene	10000	U
53-70-3	Dibenz(a,h)Anthracene	10000	U
191-24-2	Benzo(g,h,i)Perylene	10000	U

(1) - Cannot be separated from Diphenylamine

1F

EPA SAMPLE NO.

JDF9RE

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: ENCOTEC Contract: 71152

Lab Code: ENCOT Case No.: 3928 SAS No.: SDG No.: 23372

Matrix: (soil/water) SOIL Lab Sample ID: 23380BR2

Sample wt/vol: 1.0 (g/mL) G Lab File ID: 23380BR2

Level: (low/med) MED Date Received: 10/27/93

% Moisture: 0 decanted: (Y/N) N Date Extracted: 10/27/93

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 11/01/93

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH:

Number TICs found: 20 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN ALKANE	4.17	190000	J
2.		UNKNOWN ALKANE	5.20	100000	J
3.		UNKNOWN	6.12	150000	J
4.		UNKNOWN ALKANE	7.15	660000	J
5.		UNKNOWN	7.42	110000	J
6.		UNKNOWN ALKANE	7.65	390000	J
7.		UNKNOWN ALKANE	7.97	90000	J
8.		DECAHYDRONAPHTHALENE ISOMER	8.05	120000	J
9.		UNKNOWN ALKANE	8.37	110000	J
10.		UNKNOWN ALKANE	8.52	160000	J
11.		UNKNOWN ALKANE	9.30	290000	J
12.		UNKNOWN ALKANE	11.32	100000	J
13.		UNKNOWN ALKANE	14.90	69000	J
14.		UNKNOWN ALKANE	16.53	180000	J
15.	128-37-0	2,6-BIS(1,1-DIMETHYLETHYL)-4	16.67	240000	JN
16.		UNKNOWN	30.45	69000	J
17.		UNKNOWN ALKANE	31.92	720000	J
18.		UNKNOWN	33.00	1900000	J
19.		UNKNOWN ALKANE	34.17	2000000	J
20.		UNKNOWN	35.53	1800000	J

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

JDF10

Lab Name: ENCOTEC Contract: 71152

Lab Code: ENCOT Case No.: 3928 SAS No.: SDG No.: 23372

Matrix: (soil/water) WATER Lab Sample ID: 23381B

Sample wt/vol: 50.0 (g/mL) ML Lab File ID: 23381B

Level: (low/med) LOW Date Received: 10/27/93

% Moisture: decanted: (Y/N) Date Extracted: 10/28/93

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 10/29/93

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH:

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
108-95-2	Phenol	200	U
111-44-4	bis(2-Chloroethyl)Ether	200	U
95-57-8	2-Chlorophenol	200	U
541-73-1	1,3-Dichlorobenzene	200	U
106-46-7	1,4-Dichlorobenzene	200	U
95-50-1	1,2-Dichlorobenzene	200	U
108-60-1	2,2'-oxybis(1-Chloropropane)	200	U
621-64-7	N-Nitroso-Di-n-Propylamine	200	U
67-72-1	Hexachloroethane	200	U
98-95-3	Nitrobenzene	200	U
78-59-1	Isophorone	200	U
88-75-5	2-Nitrophenol	200	U
105-67-9	2,4-Dimethylphenol	200	U
111-91-1	bis(2-Chloroethoxy)Methane	200	U
120-83-2	2,4-Dichlorophenol	200	U
120-82-1	1,2,4-Trichlorobenzene	200	U
91-20-3	Naphthalene	200	U
87-68-3	Hexachlorobutadiene	200	U
59-50-7	4-Chloro-3-Methylphenol	200	U
77-47-4	Hexachlorocyclopentadiene	200	U
88-06-2	2,4,6-Trichlorophenol	200	U
91-58-7	2-Chloronaphthalene	200	U
131-11-3	Dimethylphthalate	200	U
208-96-8	Acenaphthylene	200	U
606-20-2	2,6-Dinitrotoluene	200	U
83-32-9	Acenaphthene	200	U
51-28-5	2,4-Dinitrophenol	500	U
100-02-7	4-Nitrophenol	500	U
121-14-2	2,4-Dinitrotoluene	200	U
84-66-2	Diethylphthalate	200	U
7005-72-3	4-Chlorophenyl-phenylether	200	U
86-73-7	Fluorene	200	U
534-52-1	4,6-Dinitro-2-Methylphenol	500	U

1F

EPA SAMPLE NO.

JDF10

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: ENCOTEC Contract: 71152

Lab Code: ENCOT Case No.: 3928 SAS No.: SDG No.: 23372

Matrix: (soil/water) WATER Lab Sample ID: 23381B

Sample wt/vol: 50.0 (g/mL) ML Lab File ID: 23381B

Level: (low/med) LOW Date Received: 10/27/93

% Moisture: decanted: (Y/N) Date Extracted: 10/28/93

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 10/29/93

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH:

Number TICs found: 1 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN ORGANIC ACID	4.67	120	J

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

JDF11

Lab Name: ENCOTEC Contract: 71152
Lab Code: ENCOT Case No.: 3928 SAS No.: SDG No.: 23372

Matrix: (soil/water) WATER Lab Sample ID: 23382B

Sample wt/vol: 50.0 (g/mL) ML Lab File ID: 23382B

Level: (low/med) LOW Date Received: 10/27/93

% Moisture: decanted: (Y/N) Date Extracted: 10/28/93

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 10/29/93

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH:

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
108-95-2	Phenol	200	U
111-44-4	bis(2-Chloroethyl)Ether	200	U
95-57-8	2-Chlorophenol	200	U
541-73-1	1,3-Dichlorobenzene	200	U
106-46-7	1,4-Dichlorobenzene	200	U
95-50-1	1,2-Dichlorobenzene	200	U
108-60-1	2,2'-oxybis(1-Chloropropane)	200	U
621-64-7	N-Nitroso-Di-n-Propylamine	200	U
67-72-1	Hexachloroethane	200	U
98-95-3	Nitrobenzene	200	U
78-59-1	Isophorone	200	U
88-75-5	2-Nitrophenol	200	U
105-67-9	2,4-Dimethylphenol	200	U
111-91-1	bis(2-Chloroethoxy)Methane	200	U
120-83-2	2,4-Dichlorophenol	200	U
120-82-1	1,2,4-Trichlorobenzene	200	U
91-20-3	Naphthalene	200	U
87-68-3	Hexachlorobutadiene	200	U
59-50-7	4-Chloro-3-Methylphenol	200	U
77-47-4	Hexachlorocyclopentadiene	200	U
88-06-2	2,4,6-Trichlorophenol	200	U
91-58-7	2-Chloronaphthalene	200	U
131-11-3	Dimethylphthalate	200	U
208-96-8	Acenaphthylene	200	U
606-20-2	2,6-Dinitrotoluene	200	U
83-32-9	Acenaphthene	200	U
51-28-5	2,4-Dinitrophenol	500	U
100-02-7	4-Nitrophenol	500	U
121-14-2	2,4-Dinitrotoluene	200	U
84-66-2	Diethylphthalate	200	U
7005-72-3	4-Chlorophenyl-phenylether	200	U
86-73-7	Fluorene	200	U
534-52-1	4,6-Dinitro-2-Methylphenol	500	U

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

JDF11

Lab Name: ENCOTEC Contract: 71152

Lab Code: ENCOT Case No.: 3928 SAS No.: SDG No.: 23372

Matrix: (soil/water) WATER Lab Sample ID: 23382B

Sample wt/vol: 50.0 (g/mL) ML Lab File ID: 23382B

Level: (low/med) LOW Date Received: 10/27/93

% Moisture: decanted: (Y/N) Date Extracted: 10/28/93

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 10/29/93

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH:

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
86-30-6	N-Nitrosodiphenylamine (1)	200	U
101-55-3	4-Bromophenyl-phenylether	200	U
118-74-1	Hexachlorobenzene	200	U
87-86-5	Pentachlorophenol	500	U
85-01-8	Phenanthrene	200	U
120-12-7	Anthracene	200	U
84-74-2	Di-n-Butylphthalate	200	U
206-44-0	Fluoranthene	200	U
92-87-5	Benzidine	800	U
129-00-0	Pyrene	200	U
85-68-7	Butylbenzylphthalate	200	U
91-94-1	3,3'-Dichlorobenzidine	200	U
56-55-3	Benzo(A) anthracene	200	U
218-01-9	Chrysene	200	U
117-81-7	bis(2-Ethylhexyl)Phthalate	200	U
117-84-0	Di-n-Octylphthalate	200	U
205-99-2	Benzo(b)Fluoranthene	200	U
207-08-9	Benzo(k)Fluoranthene	200	U
50-32-8	Benzo(a)Pyrene	200	U
193-39-5	Indeno(1,2,3-cd)Pyrene	200	U
53-70-3	Dibenz(a,h)Anthracene	200	U
191-24-2	Benzo(g,h,i)Perylene	200	U

(1) - Cannot be separated from Diphenylamine

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

JDF11

Lab Name: ENCOTEC Contract: 71152

Lab Code: ENCOT Case No.: 3928 SAS No.: SDG No.: 23372

Matrix: (soil/water) WATER Lab Sample ID: 23382B

Sample wt/vol: 50.0 (g/mL) ML Lab File ID: 23382B

Level: (low/med) LOW Date Received: 10/27/93

% Moisture: decanted: (Y/N) Date Extracted: 10/28/93

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 10/29/93

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH:

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

JDF12

Lab Name: ENCOTEC Contract: 71152
Lab Code: ENCOT Case No.: 3928 SAS No.: SDG No.: 23372

Matrix: (soil/water) WATER Lab Sample ID: 23383B

Sample wt/vol: 50.0 (g/mL) ML Lab File ID: 23383B

Level: (low/med) LOW Date Received: 10/27/93

% Moisture: decanted: (Y/N) Date Extracted: 10/28/93

Concentrated Extract Volume: 10000 (uL) Date Analyzed: 10/29/93

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH:

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
108-95-2	Phenol	2000	U
111-44-4	bis(2-Chloroethyl)Ether	2000	U
95-57-8	2-Chlorophenol	2000	U
541-73-1	1,3-Dichlorobenzene	2000	U
106-46-7	1,4-Dichlorobenzene	2000	U
95-50-1	1,2-Dichlorobenzene	2000	U
108-60-1	2,2'-oxybis(1-Chloropropane)	2000	U
621-64-7	N-Nitroso-Di-n-Propylamine	2000	U
67-72-1	Hexachloroethane	2000	U
98-95-3	Nitrobenzene	2000	U
78-59-1	Isophorone	2000	U
88-75-5	2-Nitrophenol	2000	U
105-67-9	2,4-Dimethylphenol	2000	U
111-91-1	bis(2-Chloroethoxy)Methane	2000	U
120-83-2	2,4-Dichlorophenol	2000	U
120-82-1	1,2,4-Trichlorobenzene	2000	U
91-20-3	Naphthalene	2000	U
87-68-3	Hexachlorobutadiene	2000	U
59-50-7	4-Chloro-3-Methylphenol	2000	U
77-47-4	Hexachlorocyclopentadiene	2000	U
88-06-2	2,4,6-Trichlorophenol	2000	U
91-58-7	2-Chloronaphthalene	2000	U
131-11-3	Dimethylphthalate	2000	U
208-96-8	Acenaphthylene	2000	U
606-20-2	2,6-Dinitrotoluene	2000	U
83-32-9	Acenaphthene	2000	U
51-28-5	2,4-Dinitrophenol	5000	U
100-02-7	4-Nitrophenol	5000	U
121-14-2	2,4-Dinitrotoluene	2000	U
84-66-2	Diethylphthalate	2000	U
7005-72-3	4-Chlorophenyl-phenylether	2000	U
86-73-7	Fluorene	2000	U
534-52-1	4,6-Dinitro-2-Methylphenol	5000	U

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

JDF12

Lab Name: ENCOTEC Contract: 71152

Lab Code: ENCOT Case No.: 3928 SAS No.: SDG No.: 23372

Matrix: (soil/water) WATER Lab Sample ID: 23383B

Sample wt/vol: 50.0 (g/mL) ML Lab File ID: 23383B

Level: (low/med) LOW Date Received: 10/27/93

% Moisture: decanted: (Y/N) Date Extracted: 10/28/93

Concentrated Extract Volume: 10000 (uL) Date Analyzed: 10/29/93

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH:

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
86-30-6	N-Nitrosodiphenylamine (1)	2000	U
101-55-3	4-Bromophenyl-phenylether	2000	U
118-74-1	Hexachlorobenzene	2000	U
87-86-5	Pentachlorophenol	5000	U
85-01-8	Phenanthrene	2000	U
120-12-7	Anthracene	2000	U
84-74-2	Di-n-Butylphthalate	2000	U
206-44-0	Fluoranthene	2000	U
92-87-5	Benzidine	2000	U
129-00-0	Pyrene	8000	U
85-68-7	Butylbenzylphthalate	2000	U
91-94-1	3,3'-Dichlorobenzidine	2000	U
56-55-3	Benzo(A) anthracene	2000	U
218-01-9	Chrysene	2000	U
117-81-7	bis(2-Ethylhexyl)Phthalate	2000	U
117-84-0	Di-n-Octylphthalate	2000	U
205-99-2	Benzo(b)Fluoranthene	2000	U
207-08-9	Benzo(k)Fluoranthene	2000	U
50-32-8	Benzo(a)Pyrene	2000	U
193-39-5	Indeno(1,2,3-cd)Pyrene	2000	U
53-70-3	Dibenz(a,h)Anthracene	2000	U
191-24-2	Benzo(g,h,i)Perylene	2000	U

(1) - Cannot be separated from Diphenylamine

1F

EPA SAMPLE NO.

JDF12

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: ENCOTEC Contract: 71152

Lab Code: ENCOT Case No.: 3928 SAS No.: SDG No.: 23372

Matrix: (soil/water) WATER Lab Sample ID: 23383B

Sample wt/vol: 50.0 (g/mL) ML Lab File ID: 23383B

Level: (low/med) LOW Date Received: 10/27/93

% Moisture: decanted: (Y/N) Date Extracted: 10/28/93

Concentrated Extract Volume: 10000 (uL) Date Analyzed: 10/29/93

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH:

Number TICs found: 16

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	758-16-7	N,N-DIMETHYL METHANTHIOAMIDE	7.68	19000	JN
2.	289-16-7	1,2,4-TRITHIOLANE	9.12	34000	JN
3.		UNKNOWN	10.35	3400	J
4.		UNKNOWN	14.13	1300	J
5.		UNKNOWN	15.40	10000	J
6.		UNKNOWN	16.27	1400	J
7.		UNKNOWN	18.07	2100	J
8.		UNKNOWN	18.80	20000	J
9.		UNKNOWN	20.10	5400	J
10.	96-45-7	2-IMIDAZOLIDINETHIONE	21.92	12000	JN
11.	10544-50-0	SULFUR	24.17	4600	JN
12.		UNKNOWN	24.70	2100	J
13.		UNKNOWN	26.38	6200	J
14.		UNKNOWN	26.97	6000	J
15.		UNKNOWN	30.05	29000	J
16.		UNKNOWN	31.75	10000	J

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

JDF8

Lab Name: ENCOTEC Contract: 71152
Lab Code: ENCOT Case No.: 3928 SAS No.: SDG No.: 23372

Matrix: (soil/water) SOIL Lab Sample ID: 23379B

Sample wt/vol: 1.0 (g/mL) G Lab File ID: 23379B

Level: (low/med) MED Date Received: 10/27/93

% Moisture: 6 decanted: (Y/N) N Date Extracted: 10/27/93

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 10/29/93

Injection Volume: 2.0(uL) Dilution Factor: 2.0

GPC Cleanup: (Y/N) N pH:

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	21000	U
111-44-4	bis(2-Chloroethyl)Ether	21000	U
95-57-8	2-Chlorophenol	21000	U
541-73-1	1,3-Dichlorobenzene	21000	U
106-46-7	1,4-Dichlorobenzene	21000	U
95-50-1	1,2-Dichlorobenzene	21000	U
108-60-1	2,2'-oxybis(1-Chloropropane)	21000	U
621-64-7	N-Nitroso-Di-n-Propylamine	21000	U
67-72-1	Hexachloroethane	21000	U
98-95-3	Nitrobenzene	21000	U
78-59-1	Isophorone	21000	U
88-75-5	2-Nitrophenol	21000	U
105-67-9	2,4-Dimethylphenol	21000	U
111-91-1	bis(2-Chloroethoxy)Methane	21000	U
120-83-2	2,4-Dichlorophenol	21000	U
120-82-1	1,2,4-Trichlorobenzene	21000	U
91-20-3	Naphthalene	21000	U
87-68-3	Hexachlorobutadiene	21000	U
59-50-7	4-Chloro-3-Methylphenol	21000	U
77-47-4	Hexachlorocyclopentadiene	21000	U
88-06-2	2,4,6-Trichlorophenol	21000	U
91-58-7	2-Chloronaphthalene	21000	U
131-11-3	Dimethylphthalate	21000	U
208-96-8	Acenaphthylene	21000	U
606-20-2	2,6-Dinitrotoluene	21000	U
83-32-9	Acenaphthene	21000	U
51-28-5	2,4-Dinitrophenol	53000	U
100-02-7	4-Nitrophenol	53000	U
121-14-2	2,4-Dinitrotoluene	21000	U
84-66-2	Diethylphthalate	21000	U
7005-72-3	4-Chlorophenyl-phenylether	21000	U
86-73-7	Fluorene	21000	U
534-52-1	4,6-Dinitro-2-Methylphenol	53000	U

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

JDF8

Lab Name: ENCOTEC Contract: 71152

Lab Code: ENCOT Case No.: 3928 SAS No.: SDG No.: 23372

Matrix: (soil/water) SOIL Lab Sample ID: 23379B

Sample wt/vol: 1.0 (g/mL) G Lab File ID: 23379B

Level: (low/med) MED Date Received: 10/27/93

% Moisture: 6 decanted: (Y/N) N Date Extracted: 10/27/93

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 10/29/93

Injection Volume: 2.0(uL) Dilution Factor: 2.0

GPC Cleanup: (Y/N) N pH:

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
86-30-6	N-Nitrosodiphenylamine (1)	21000	U
101-55-3	4-Bromophenyl-phenylether	21000	U
118-74-1	Hexachlorobenzene	21000	U
87-86-5	Pentachlorophenol	53000	U
85-01-8	Phenanthrene	21000	U
120-12-7	Anthracene	21000	U
84-74-2	Di-n-Butylphthalate	21000	U
206-44-0	Fluoranthene	21000	U
92-87-5	Benzidine	200000	U
129-00-0	Pyrene	21000	U
85-68-7	Butylbenzylphthalate	21000	U
91-94-1	3,3'-Dichlorobenzidine	21000	U
56-55-3	Benzo(A) anthracene	21000	U
218-01-9	Chrysene	21000	U
117-81-7	bis(2-Ethylhexyl)Phthalate	21000	U
117-84-0	Di-n-Octylphthalate	21000	U
205-99-2	Benzo(b)Fluoranthene	21000	U
207-08-9	Benzo(k)Fluoranthene	21000	U
50-32-8	Benzo(a)Pyrene	21000	U
193-39-5	Indeno(1,2,3-cd)Pyrene	21000	U
53-70-3	Dibenz(a,h)Anthracene	21000	U
191-24-2	Benzo(g,h,i)Perylene	21000	U

(1) - Cannot be separated from Diphenylamine

1F

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

JDF8

Lab Name: ENCOTEC Contract: 71152

Lab Code: ENCOT Case No.: 3928 SAS No.: SDG No.: 23372

Matrix: (soil/water) SOIL Lab Sample ID: 23379B

Sample wt/vol: 1.0 (g/mL) G Lab File ID: 23379B

Level: (low/med) MED Date Received: 10/27/93

% Moisture: 6 decanted: (Y/N) N Date Extracted: 10/27/93

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 10/29/93

Injection Volume: 2.0(uL) Dilution Factor: 2.0

GPC Cleanup: (Y/N) N pH:

Number TICs found: 21

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN ALKANE	3.88	200000	J
2.		UNKNOWN ALKANE	4.53	870000	J
3.		UNKNOWN ALKANE	4.75	110000	J
4.		UNKNOWN ALKYL BENZENE	4.97	98000	J
5.		UNKNOWN ALKANE	5.13	120000	J
6.		UNKNOWN ALKANE	5.40	62000	J
7.		UNKNOWN ALKANE	5.57	87000	J
8.		UNKNOWN ALKYL BENZENE	5.78	93000	J
9.		UNKNOWN ALKYL BENZENE	6.03	150000	J
10.		UNKNOWN ALKYL BENZENE	6.20	85000	J
11.		UNKNOWN ALKANE	7.23	270000	J
12.		UNKNOWN ALKANE	9.62	43000	J
13.		UNKNOWN	21.75	27000	J
14.		UNKNOWN	24.92	49000	J
15.		UNKNOWN	25.97	63000	J
16.		UNKNOWN	27.18	35000	J
17.		UNKNOWN	28.17	37000	J
18.		UNKNOWN	28.73	83000	J
19.		UNKNOWN	29.68	65000	J
20.		UNKNOWN	32.13	290000	J
21.		UNKNOWN	33.00	230000	J

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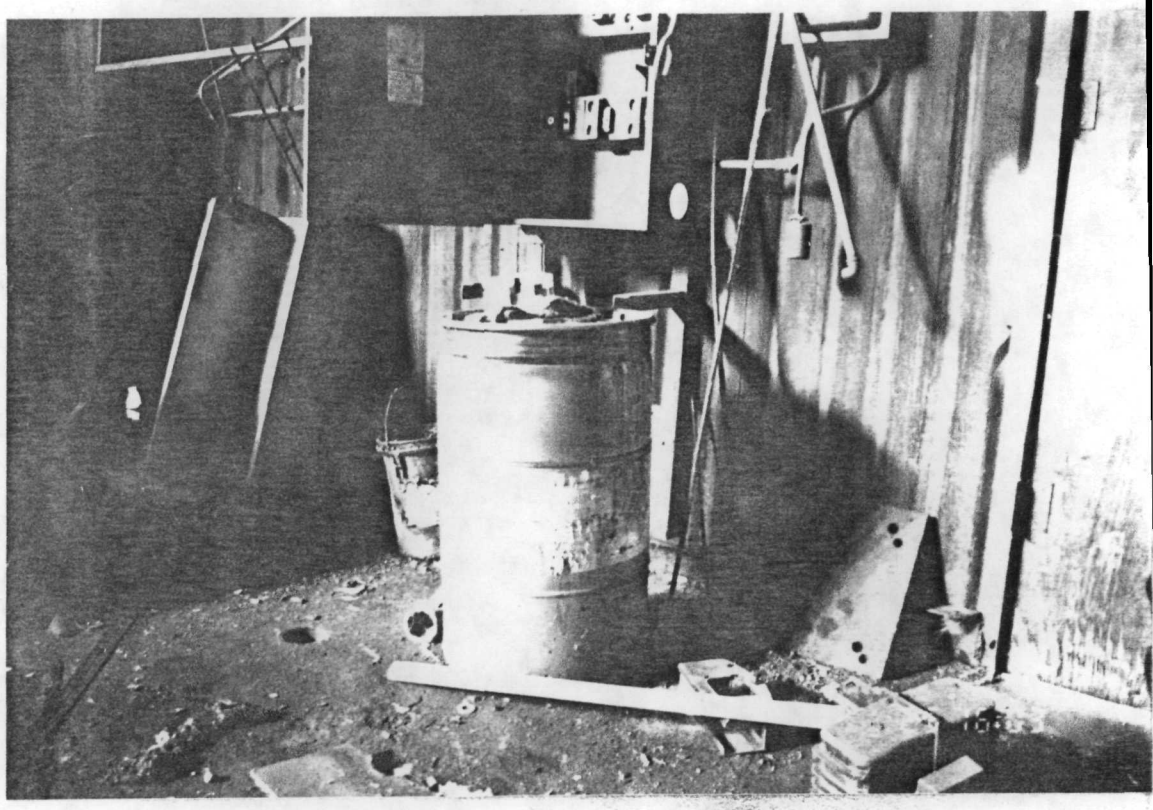
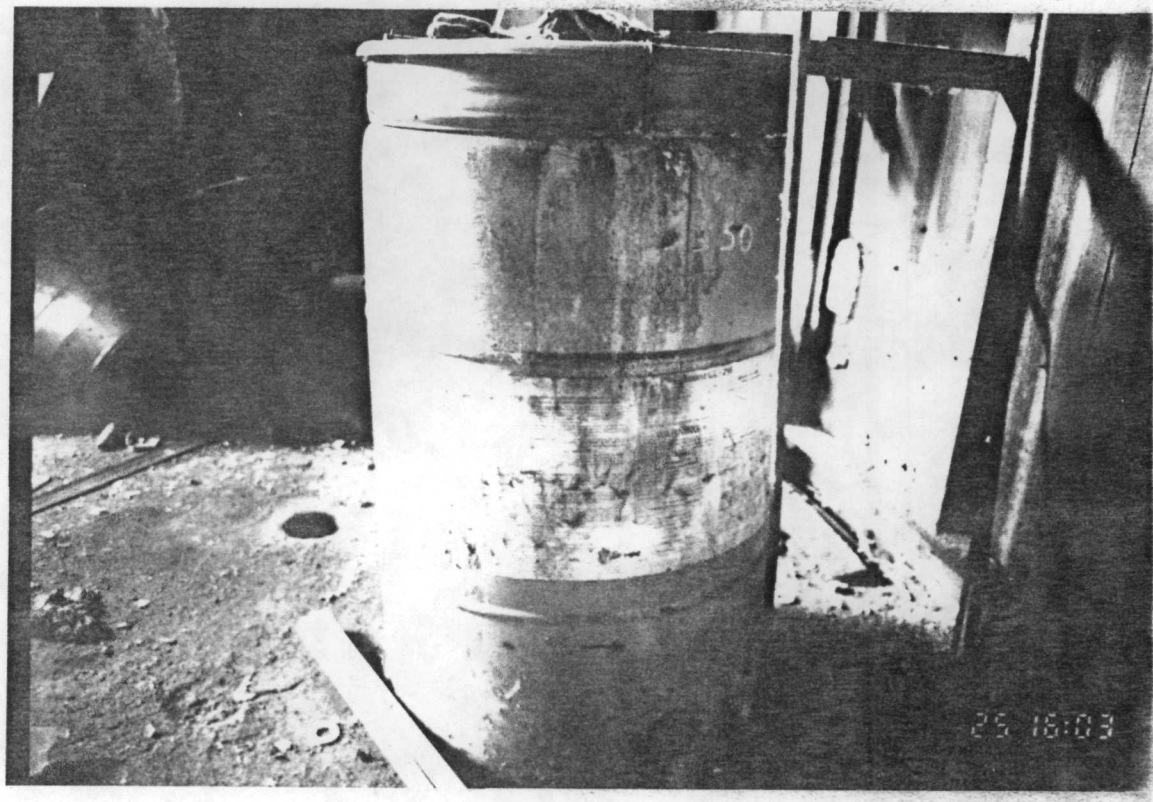
Appendix C
Annotated Photolog
Jackson Drop Forge
Site Assessment



Site: JACKSON DROP FORGE
Photo No: 61
Direction: N/A
Camera: MINOLTA
Photographer: LANCASTER

Date: OCTOBER 25, 1993
Subject: DRUM FROM WHICH SAMPLE JDF#12 WAS COLLECTED. SAMPLE WAS A YELLOW LIQUID, PID READING OF DRUM WAS 106 ppm.



Site: JACKSON DROP FORGE
Photo No: 62
Direction: N/A
Camera: MINOLTA
Photographer: LANCASTER

Date: OCTOBER 25, 1993
Subject: VIEW OF LABEL FROM SAME DRUM IN PHOTO 61.

Site: JACKSON DROP FORGE
Photo No: 01
Direction: EAST
Camera: MINOLTA
Photographer: DIECKHAUS

Date: OCTOBER 15, 1993
Subject: PANORAMA VIEW OF JACKSON DROP FORGE PARKING AREA AND FIELD NORTH OF FACILITY (SEE PHOTOS 2 & 3).

Site: JACKSON DROP FORGE
Photo No: 02
Direction: NORTHEAST
Camera: MINOLTA
Photographer: DIECKHAUS

Date: OCTOBER 15, 1993
Subject: PANORAMA VIEW OF PARKING AREA AND FIELD NORTH OF FACILITY (SEE PHOTOS 1 & 3).

Site: JACKSON DROP FORGE
Photo No: 03
Direction: NORTH
Camera: MINOLTA
Photographer: DIECKHAUS

Date: OCTOBER 15, 1993
Subject: PANORAMA OF JDF PARKING AREA AND FIELD (SEE PHOTOS 2 & 3).

Site: JACKSON DROP FORGE
Photo No: 04
Direction: WEST
Camera: MINOLTA
Photographer: DIECKHAUS

Date: OCTOBER 15, 1993
Subject: DRUM PARTIALLY BURIED ON RIVERBANK OF GRAND RIVER.

Site: JACKSON DROP FORGE
Photo No: 05
Direction: EAST
Camera: MINOLTA
Photographer: DIECKHAUS

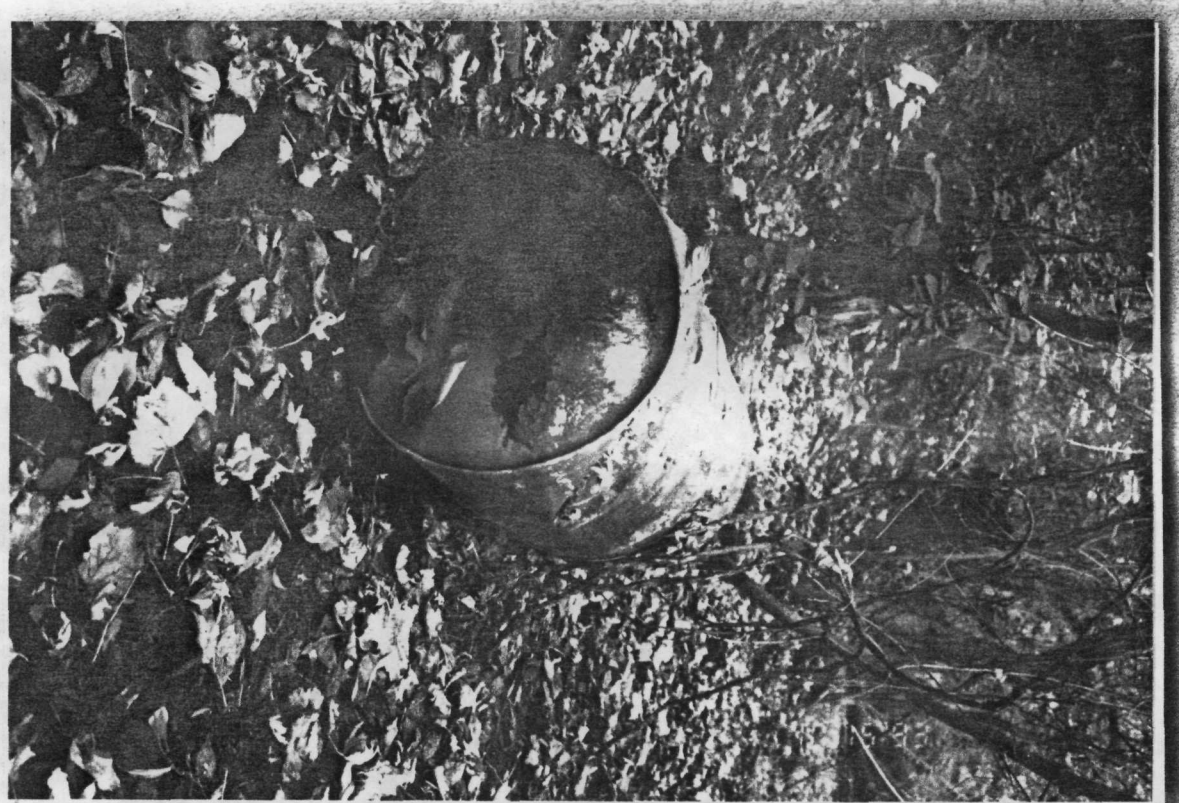
Date: OCTOBER 15, 1993
Subject: SURFACE DRUMS AND HARDENED BLACK WASTE ON RIDGE.

Site: JACKSON DROP FORGE
Photo No: 06
Direction: EAST
Camera: MINOLTA
Photographer: DIECKHAUS

Date: OCTOBER 15, 1993
Subject: 5-GALLON CONTAINERS PILED ON SURFACE OF RIDGE AND FLOOD PLAIN.

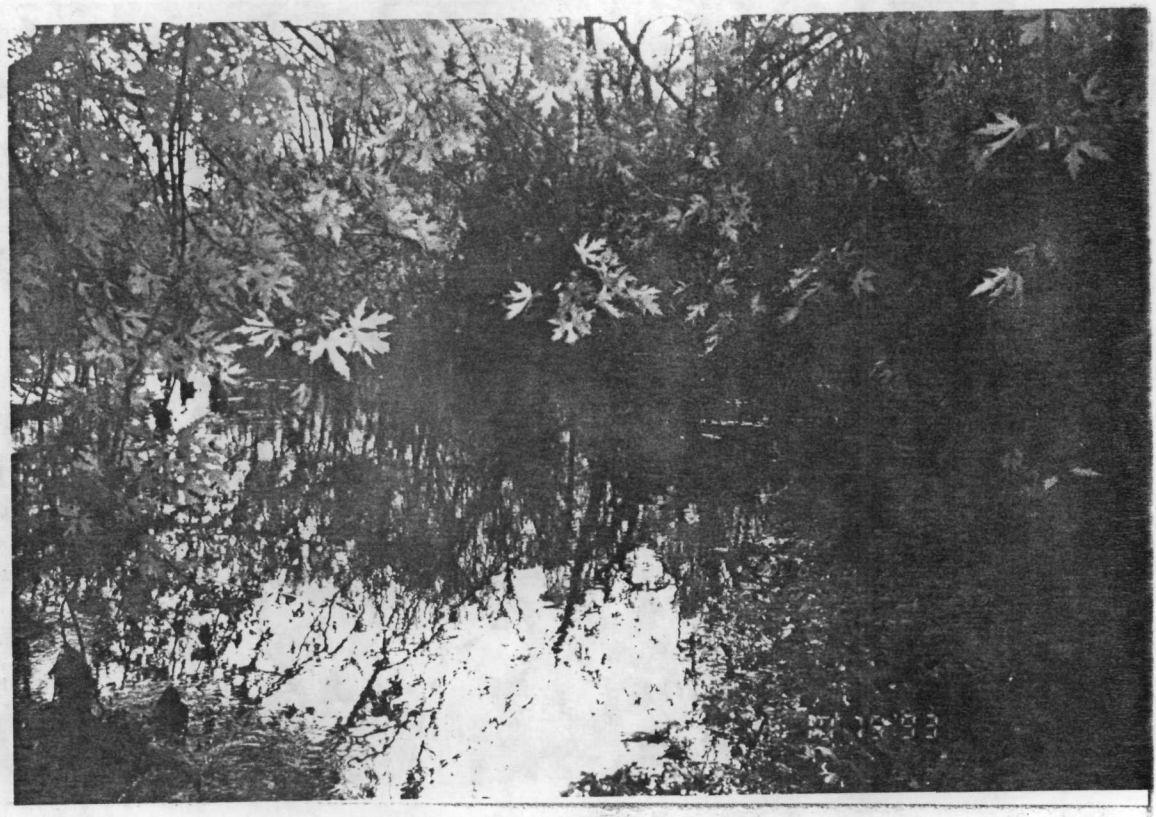
Site: JACKSON DROP FORGE
Photo No: 07
Direction: N/A
Camera: MINOLTA
Photographer: DIECKHAUS

Date: OCTOBER 15, 1993
Subject: HARDENED BLACK WASTE ON SOIL SURFACE ON RIDGE AND FLOOD PLAIN AREA.



Site: JACKSON DROP FORGE
Photo No: 08
Direction: NORTHWEST
Camera: MINOLTA
Photographer: DIECKHAUS

Date: OCTOBER 15, 1993
Subject: RUSTED AND DETERIORATED DRUM ON FLOOD PLAIN OF GRAND RIVER.



Site: JACKSON DROP FORGE
Photo No: 09
Direction: EAST
Camera: MINOLTA
Photographer: DIECKHAUS

Date: OCTOBER 15, 1993
Subject: A PORTION OF THE GRAND RIVER AND ITS FLOOD PLAIN.

Site: JACKSON DROP FORGE
Photo No: 10
Direction: NORTHEAST
Camera: MINOLTA
Photographer: DIECKHAUS

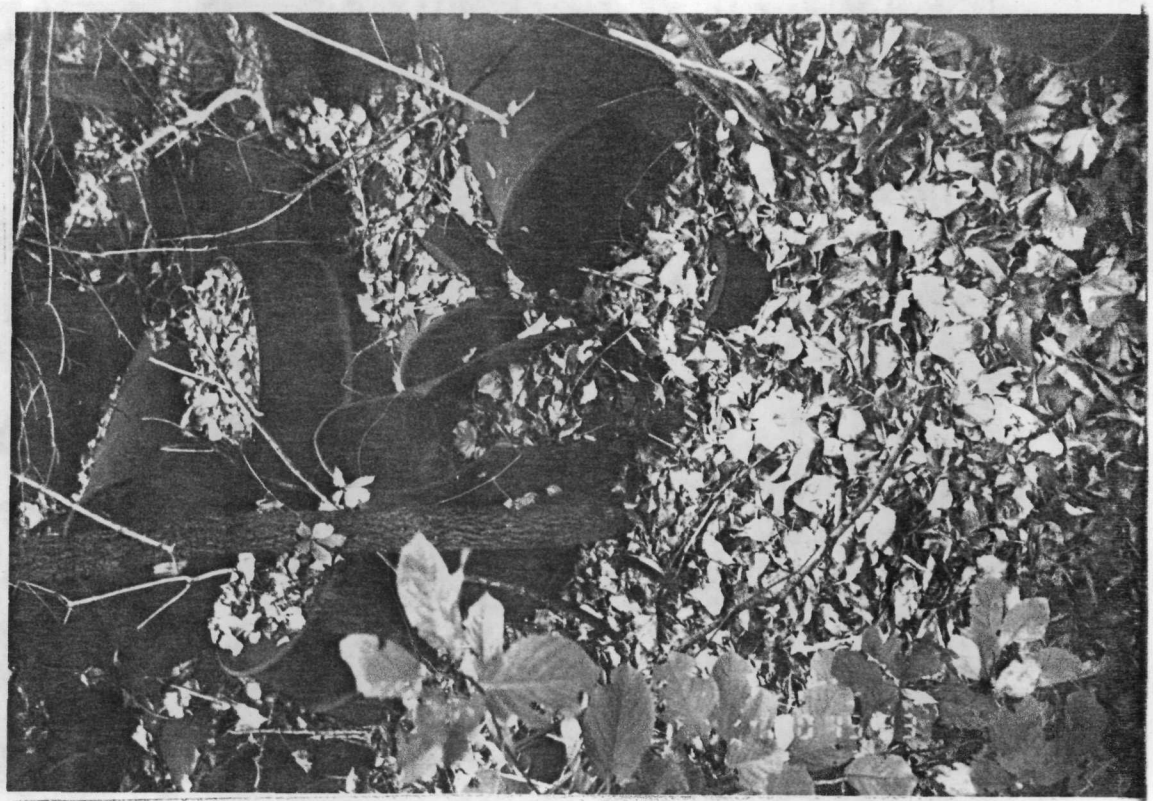
Date: OCTOBER 15, 1993
Subject: A PORTION OF THE GRAND RIVER AND ITS FLOOD PLAIN.

Site: JACKSON DROP FORGE
Photo No: 11
Direction: SOUTH
Camera: MINOLTA
Photographer: DIECKHAUS

Date: OCTOBER 15, 1993
Subject: DRUMS AND ABANDONED EQUIPMENT ON FLOOD PLAIN NORTH OF RIDGE.

Site: JACKSON DROP FORGE
Photo No: 12
Direction: SOUTH
Camera: MINOLTA
Photographer: DIECKHAUS

Date: OCTOBER 15, 1993
Subject: DRUMS AND METAL DEBRIS ON RIDGE NORTH OF WELLWORTH AVENUE.



Site: JACKSON DROP FORGE
Photo No: 13
Direction: EAST
Camera: MINOLTA
Photographer: DIECKHAUS

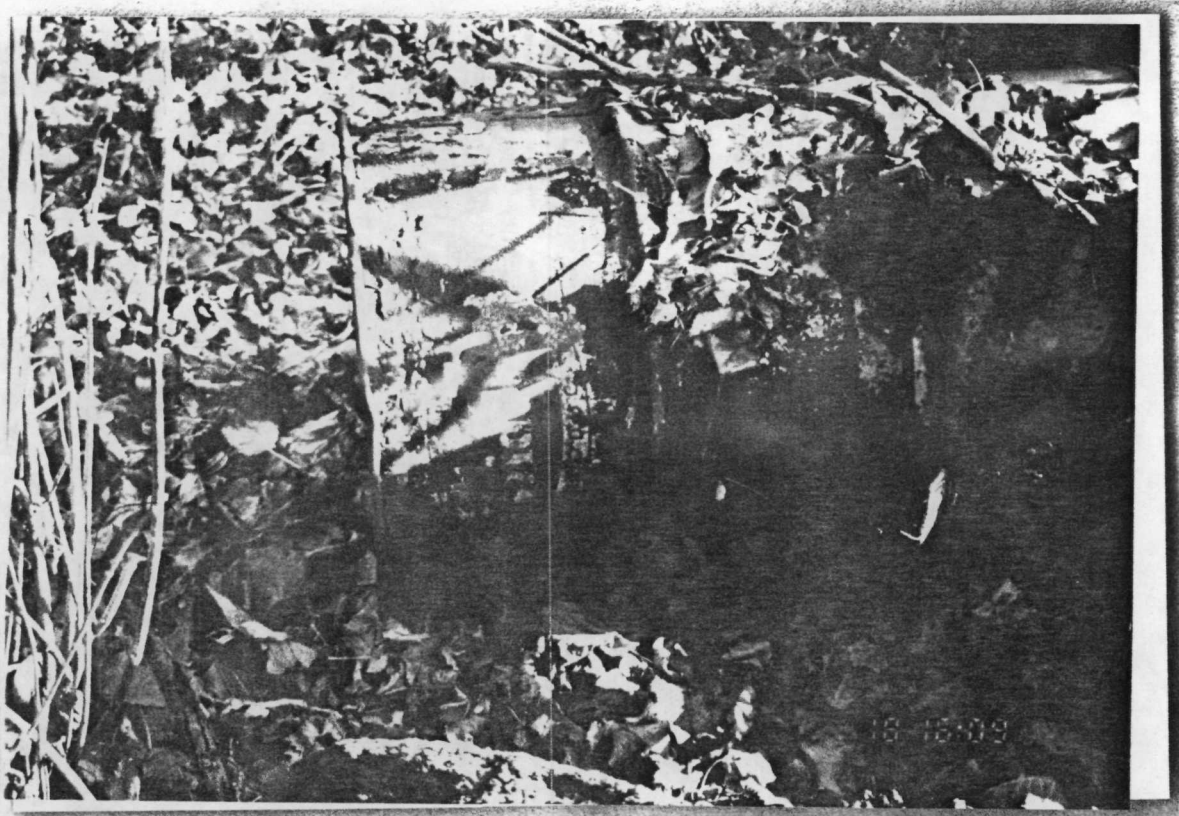
Date: OCTOBER 15, 1993
Subject: RUSTED AND DENTED SURFACE DRUMS, SOME CONTAINING BLACK HARDENED WASTES.

Site: JACKSON DROP FORGE
Photo No: 14
Direction: SOUTHEAST
Camera: MINOLTA
Photographer: DIECKHAUS

Date: OCTOBER 15, 1993
Subject: SURFACE DRUMS PILED ON RIDGE.

Site: JACKSON DROP FORGE
Photo No: 15
Direction: EAST
Camera: MINOLTA
Photographer: DIECKHAUS

Date: OCTOBER 15, 1993
Subject: DRUMS PILED AND ABANDONED ON RIDGE AND FLOOD PLAIN OF THE GRAND RIVER.



Site: JACKSON DROP FORGE
Photo No: 16
Direction: SOUTH
Camera: MINOLTA
Photographer: DIECKHAUS

Date: OCTOBER 18, 1993
Subject: GLIDDEN LABEL ON DRUM IN FLOOD PLAIN.

Site: JACKSON DROP FORGE
Photo No: 17
Direction: SOUTH
Camera: MINOLTA
Photographer: DIECKHAUS

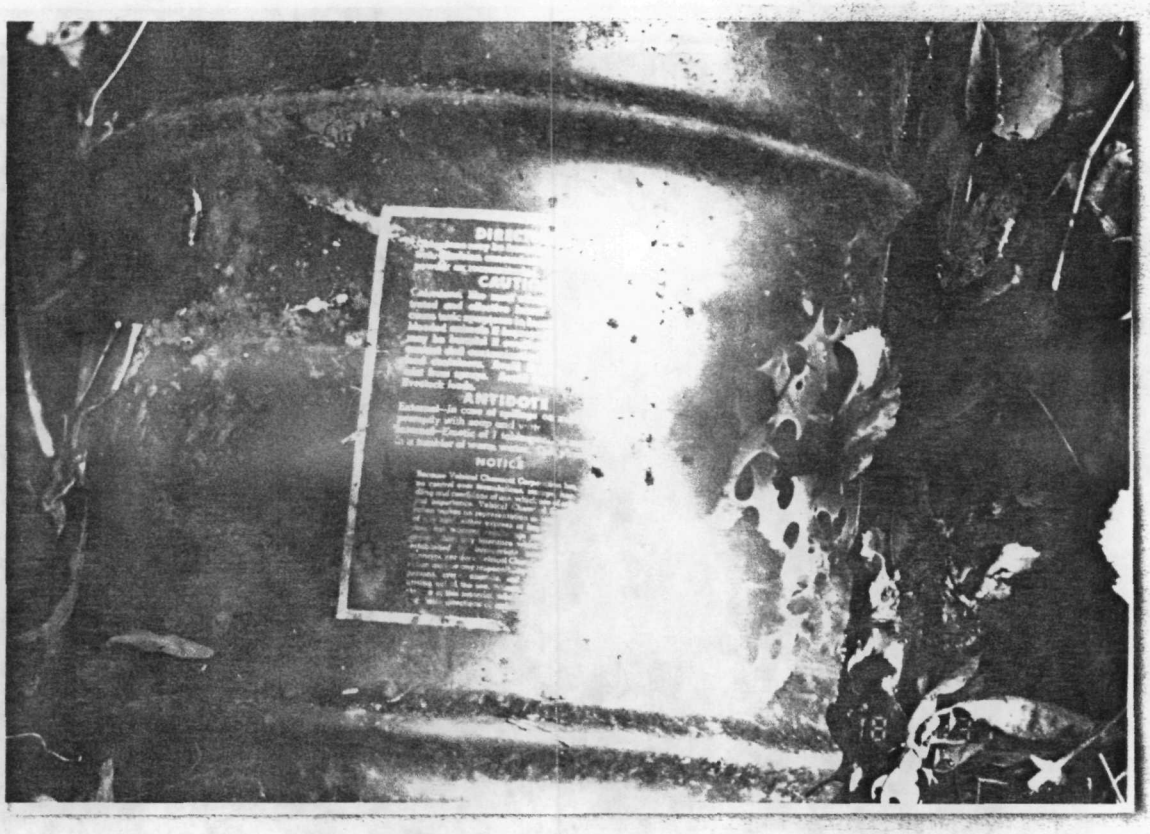
Date: OCTOBER 18, 1993
Subject: CLOSE-UP OF GLIDDEN DRUM ON FLOOD PLAIN.

Site: JACKSON DROP FORGE
Photo No: 18
Direction: NORTH
Camera: MINOLTA
Photographer: DIECKHAUS

Date: OCTOBER 18, 1993
Subject: 55-GALLON DRUM LABELED "JACKSON DROP FORGE, JACKSON-MICHIGAN, HOT HEADER...HH-12".

Site: JACKSON DROP FORGE
Photo No: 19
Direction: NORTH
Camera: MINOLTA
Photographer: DIECKHAUS

Date: OCTOBER 18, 1993
Subject: VIEW OF DRUM FROM PHOTO 18, NOTE DRUMS ARE PARTIALLY COVERED WITH FILL.

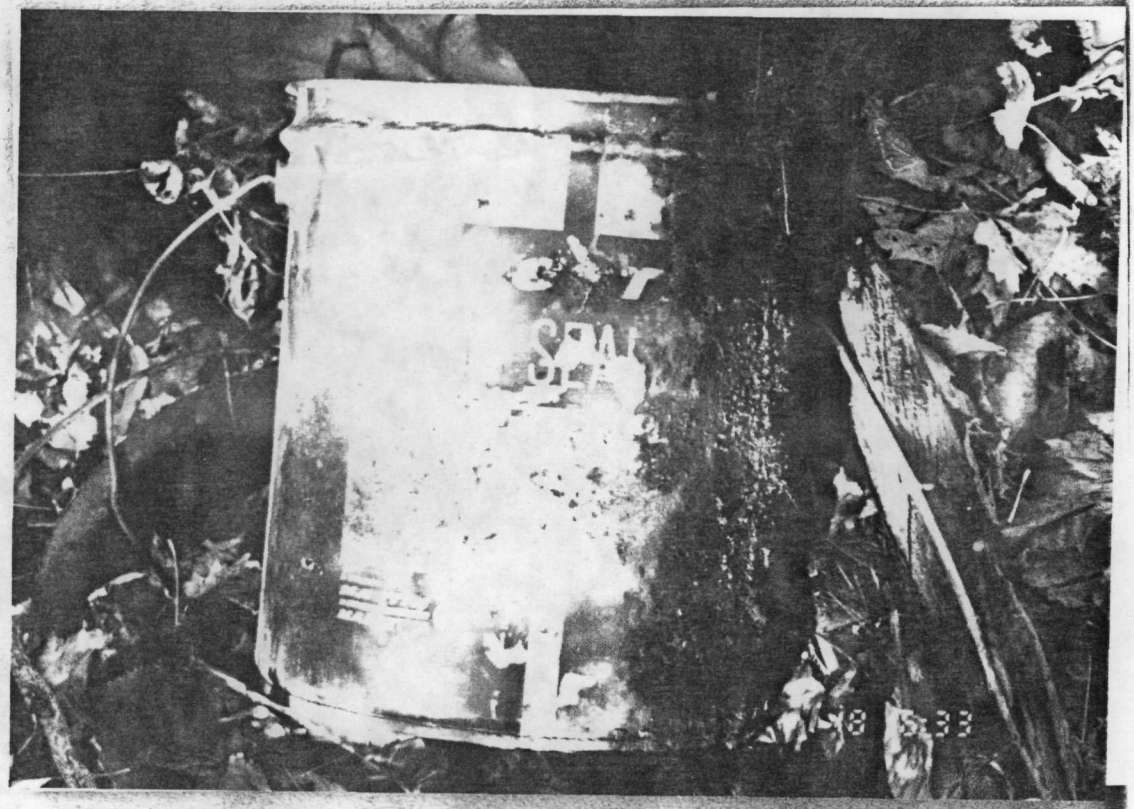


Site: JACKSON DROP FORGE
Photo No: 20
Direction: N/A
Camera: MINOLTA
Photographer: DIECKHAUS

Date: OCTOBER 18, 1993
Subject: LABEL MENTIONS CONTENTS OF DRUM WAS CHLORDANE MANUFACTURED BY VELSICOL CHEMICAL CORP. (SEE PHOTO 21).

Site: JACKSON DROP FORGE
Photo No: 21
Direction: SOUTHWEST
Camera: MINOLTA
Photographer: DIECKHAUS

Date: OCTOBER 18, 1993
Subject: 55-GALLON DRUM LABELED CHLORDANE (VELSICOL CHEMICAL CORP.) LOCATED IN THE FLOOD PLAIN OF THE GRAND RIVER.

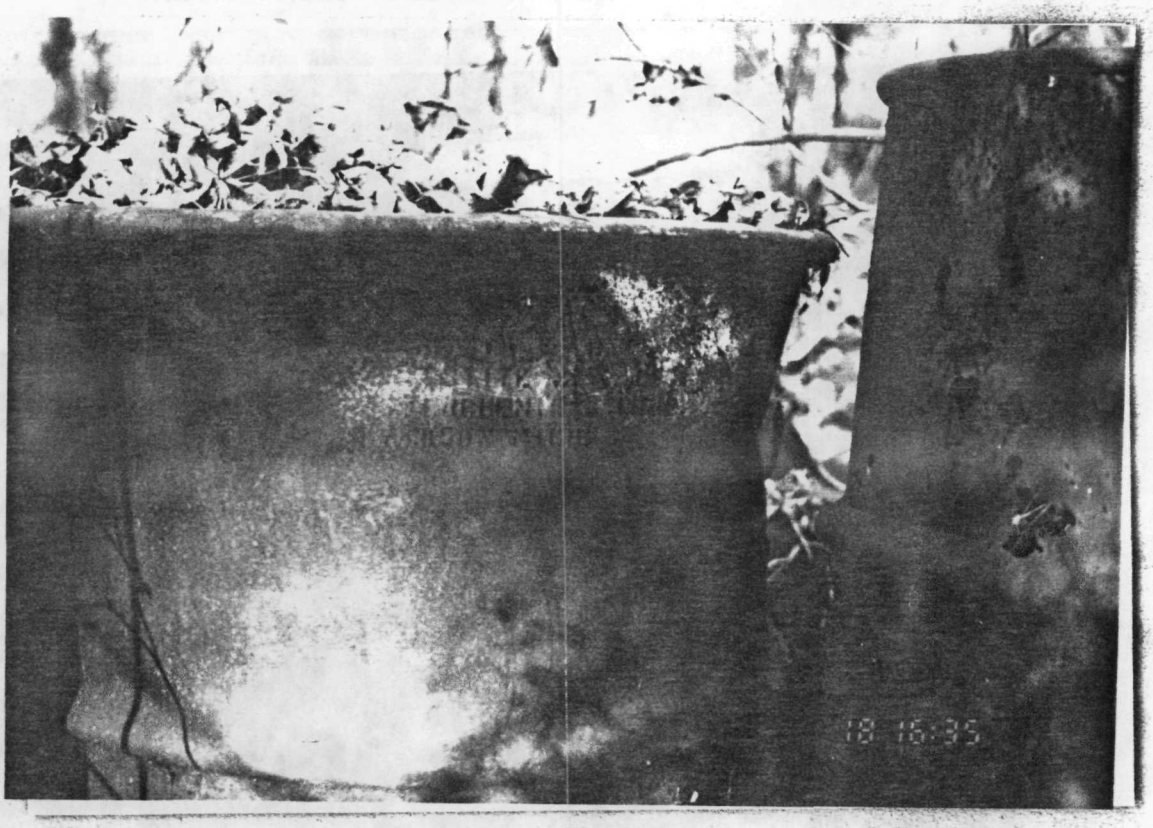


Site: JACKSON DROP FORGE
Photo No: 22
Direction: N/A
Camera: MINOLTA
Photographer: DIECKHAUS

Date: OCTOBER 18, 1993
Subject: 5-GALLON CONTAINER "PRESSTITE SEALANT - A DIVISION OF MARTIN-MARIETTA".

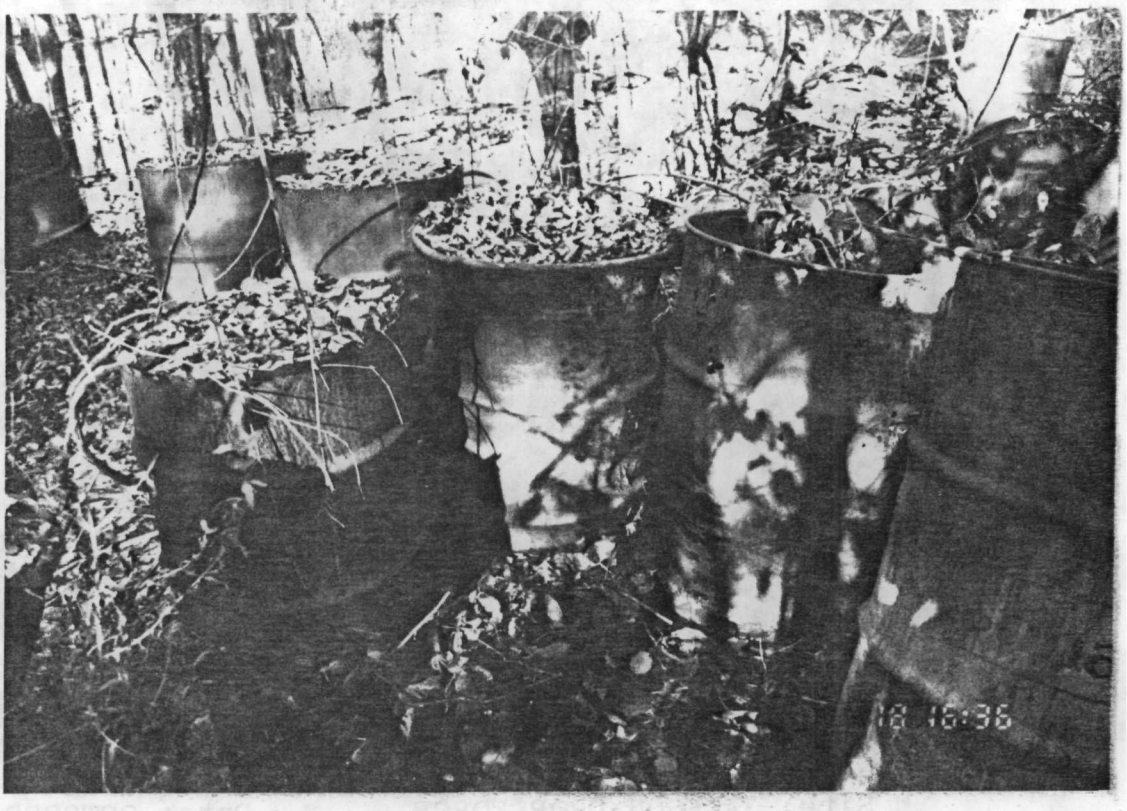
Site: JACKSON DROP FORGE
Photo No: 23
Direction: SOUTH
Camera: MINOLTA
Photographer: DIECKHAUS

Date: OCTOBER 18, 1993
Subject: TWO, 5-GALLON CONTAINERS WITH "PRESSTITE SEALANT" LABELS.



Site: JACKSON DROP FORGE
Photo No: 24
Direction: NORTHEAST
Camera: MINOLTA
Photographer: DIECKHAUS

Date: OCTOBER 18, 1993
Subject: "PRESSTITE SEALANT, ...TERCHEMICAL CORP., JACKSON, MICH."



Site: JACKSON DROP FORGE
Photo No: 25
Direction: NORTHEAST
Camera: MINOLTA
Photographer: DIECKHAUS

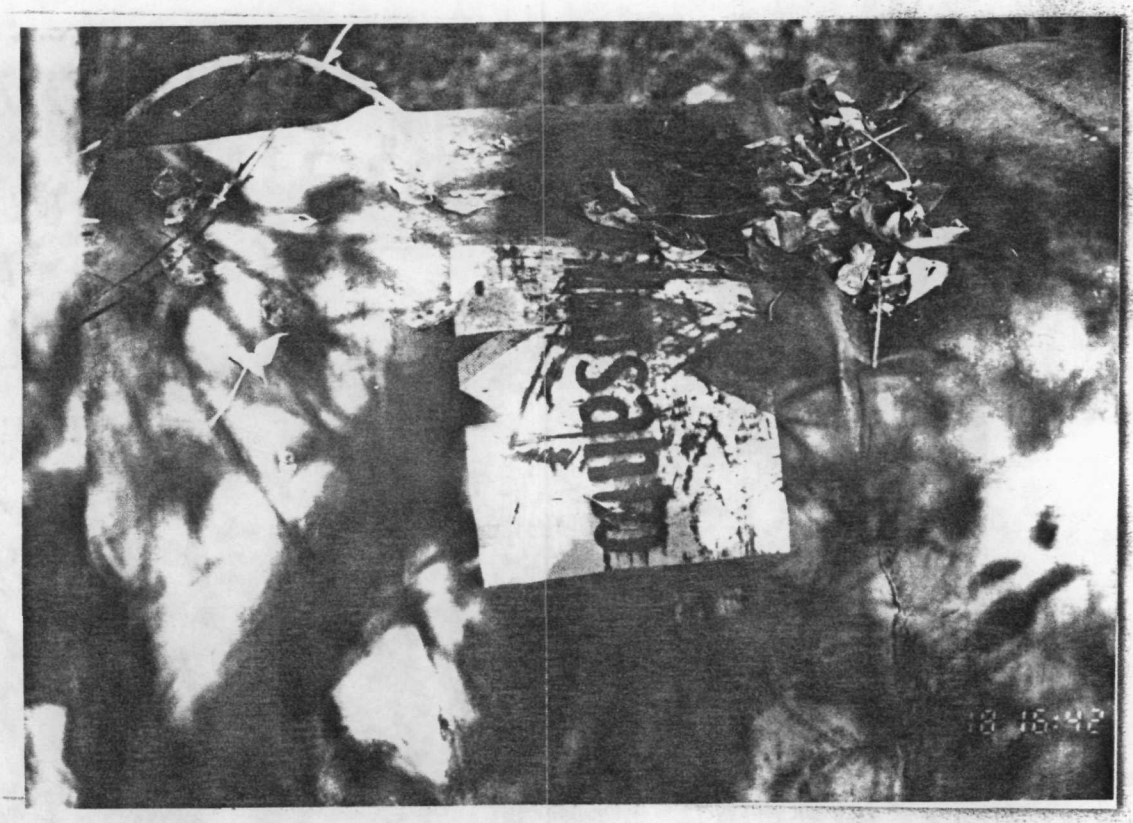
Date: OCTOBER 18, 1993
Subject: VIEW OF DRUMS IN FLOOD PLAIN (SEE PHOTO 24).

Site: JACKSON DROP FORGE
Photo No: 26
Direction: EAST
Camera: MINOLTA
Photographer: DIECKHAUS

Date: OCTOBER 18, 1993
Subject: CLOSEUP OF EASTMAN CHEMICAL PRODUCTS, INC., DRUM.

Site: JACKSON DROP FORGE
Photo No: 27
Direction: EAST
Camera: MINOLTA
Photographer: DIECKHAUS

Date: OCTOBER 18, 1993
Subject: EASTMAN CHEMICAL PRODUCTS, INC., 55-GALLON DRUM.



Site: JACKSON DROP FORGE
Photo No: 28
Direction: EAST
Camera: MINOLTA
Photographer: DIECKHAUS

Date: OCTOBER 18, 1993
Subject: CLOSEUP OF MONSANTO DRUM.

Site: JACKSON DROP FORGE
Photo No: 29
Direction: EAST
Camera: MINOLTA
Photographer: DIECKHAUS

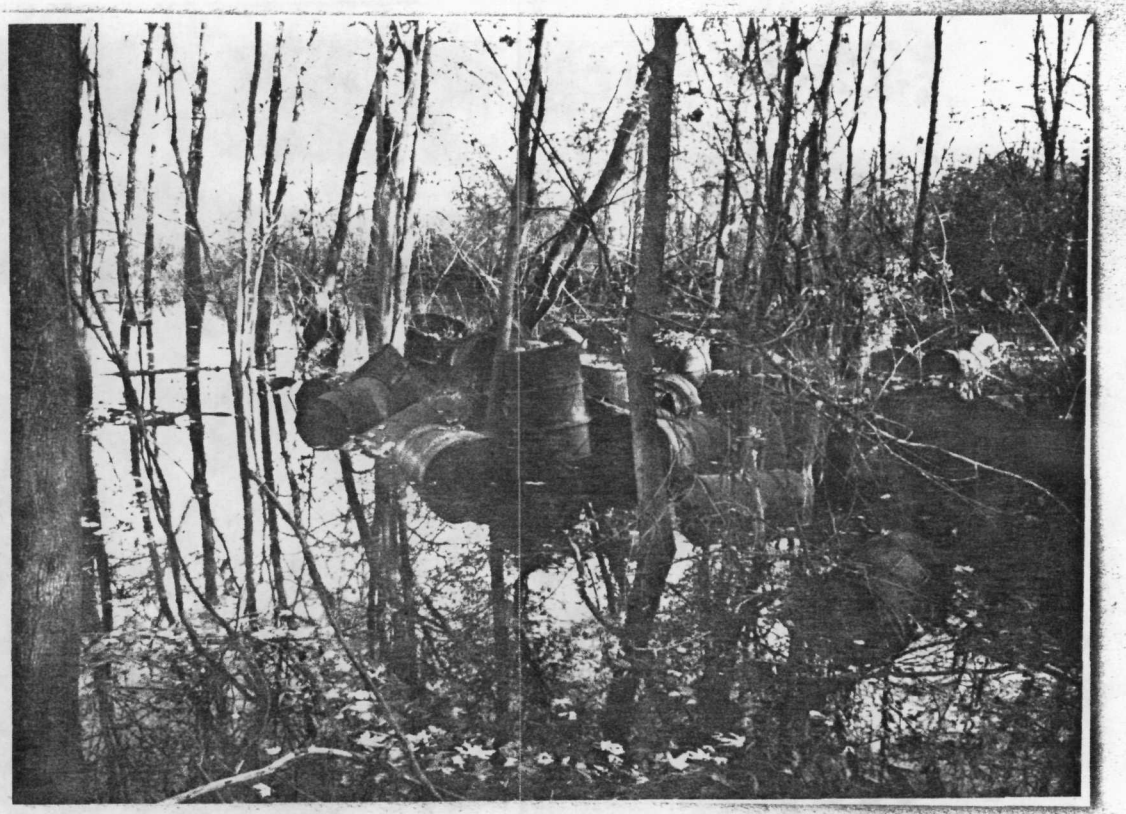
Date: OCTOBER 18, 1993
Subject: MONSANTO DRUM LOCATED NEAR EASTERN EDGE OF SITE.

Site: JACKSON DROP FORGE
Photo No: 30
Direction: NORTHEAST
Camera: MINOLTA
Photographer: DIECKHAUS

Date: OCTOBER 18, 1993
Subject: "CHLORDANE COMMERCIAL (AG) GRADE", VELSICOL CHEMICAL CORPORATION, CHICAGO, ILL.

Site: JACKSON DROP FORGE
Photo No: 31
Direction: NORTHEAST
Camera: MINOLTA
Photographer: DIECKHAUS

Date: OCTOBER 18, 1993
Subject: 55-GALLON DRUM WITH "CHLORDANE" LABEL.

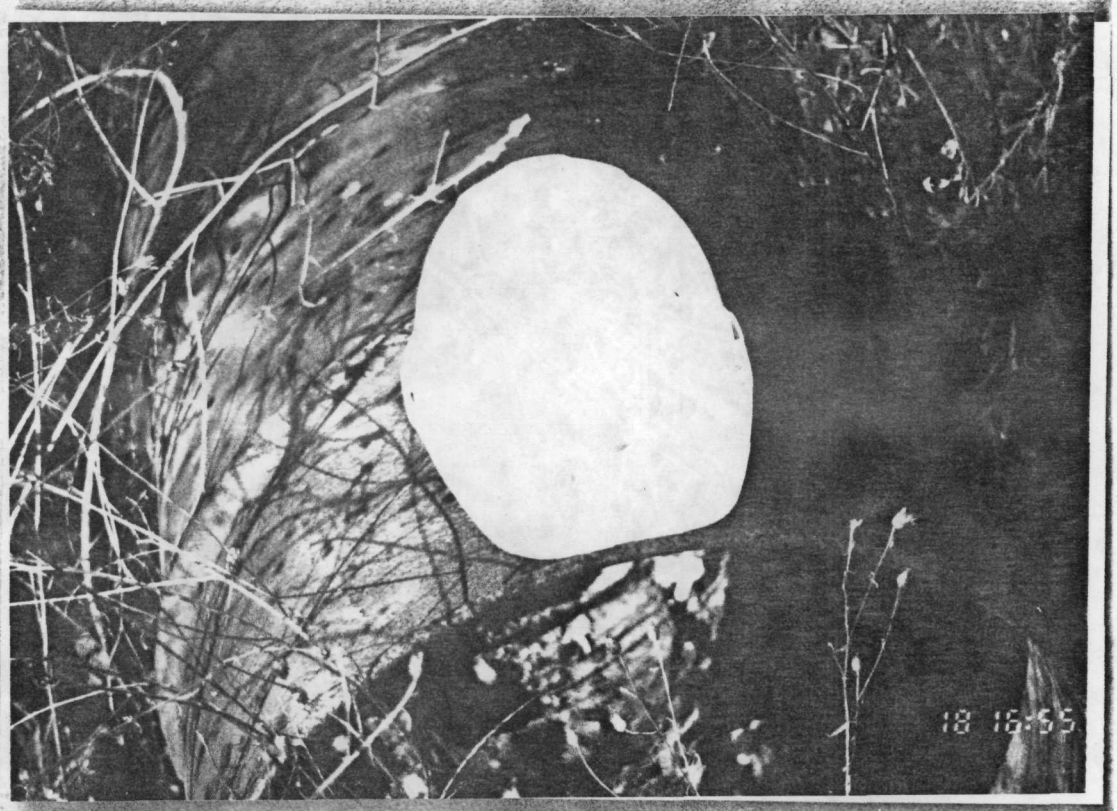


Site: JACKSON DROP FORGE
Photo No: 32
Direction: EAST
Camera: MINOLTA
Photographer: DIECKHAUS

Date: OCTOBER 18, 1993
Subject: 55-GALLON DRUMS STANDING IN THE WATERS OF THE FLOOD PLAIN.

Site: JACKSON DROP FORGE
Photo No: 33
Direction: EAST
Camera: MINOLTA
Photographer: DIECKHAUS

Date: OCTOBER 18, 1993
Subject: DRUMS AND CONTAINERS SCATTERED THROUGHOUT FLOOD PLAIN, NOTE WATER AROUND CONTAINERS ON LEFT.



Site: JACKSON DROP FORGE
Photo No: 34
Direction: NORTH
Camera: MINOLTA
Photographer: DIECKHAUS

Date: OCTOBER 18, 1993
Subject: ALRO STEEL CORPORATION HARD HAT FOUND AT SITE.

Site: JACKSON DROP FORGE
Photo No: 35
Direction: NORTH
Camera: MINOLTA
Photographer: DIECKHAUS

Date: OCTOBER 18, 1993
Subject: VIEW OF DRUMS AND CONTAINERS AND THEIR PROXIMITY TO THE WATERS OF THE GRAND RIVER.

Site: JACKSON DROP FORGE
Photo No: 36
Direction: EAST
Camera: MINOLTA
Photographer: DIECKHAUS

Date: OCTOBER 18, 1993
Subject: "ZEP - FIRST IN MAINTENANCE PRODUCTS" DRUM.

Site: JACKSON DROP FORGE
Photo No: 37
Direction: NORTH
Camera: MINOLTA
Photographer: DIECKHAUS

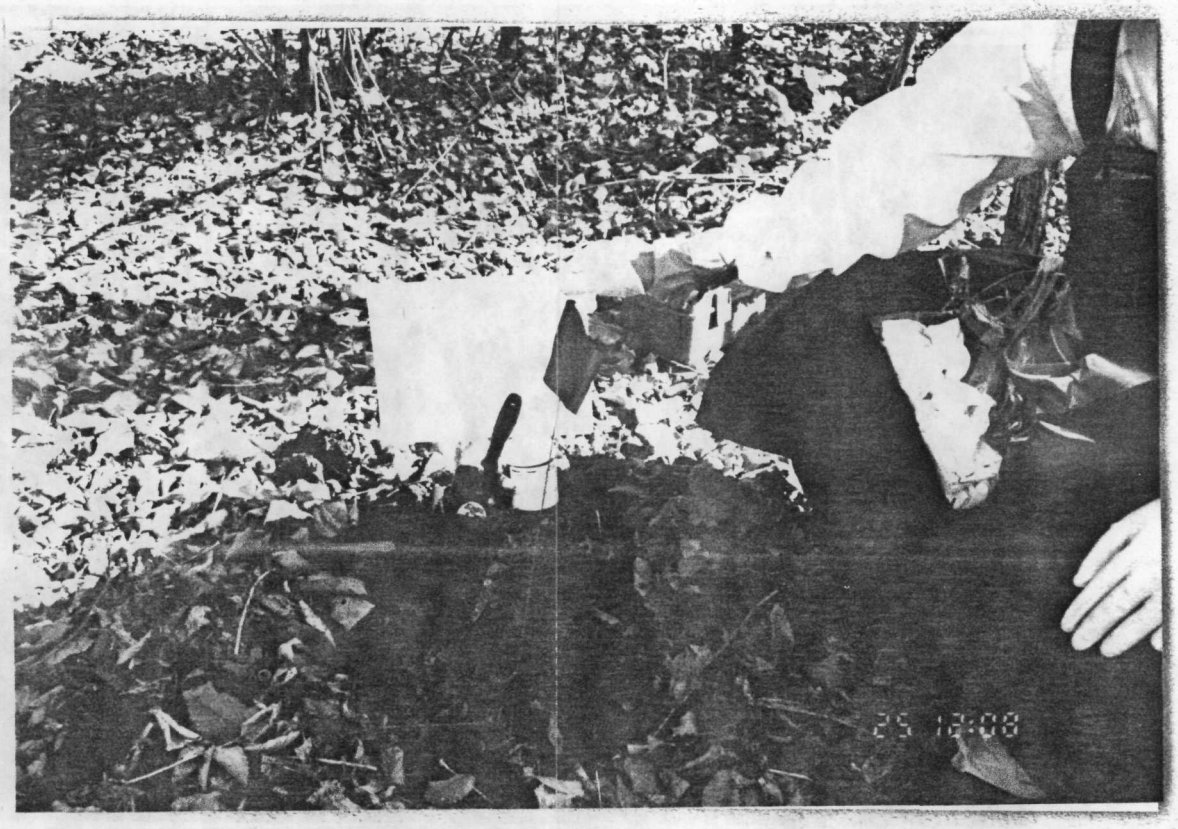
Date: OCTOBER 18, 1993
Subject: RANDUSTRIAL "MAGIC FLOOR" DRUM, RANDUSTRIAL CORPORATION, CLEVELAND, OHIO.

Site: JACKSON DROP FORGE
Photo No: 38
Direction: EAST
Camera: MINOLTA
Photographer: DIECKHAUS

Date: OCTOBER 18, 1993
Subject: DRUMS PARTIALLY COVERED WITH FILL LOCATED BEHIND HOUSE ON WELLWORTH AVENUE.

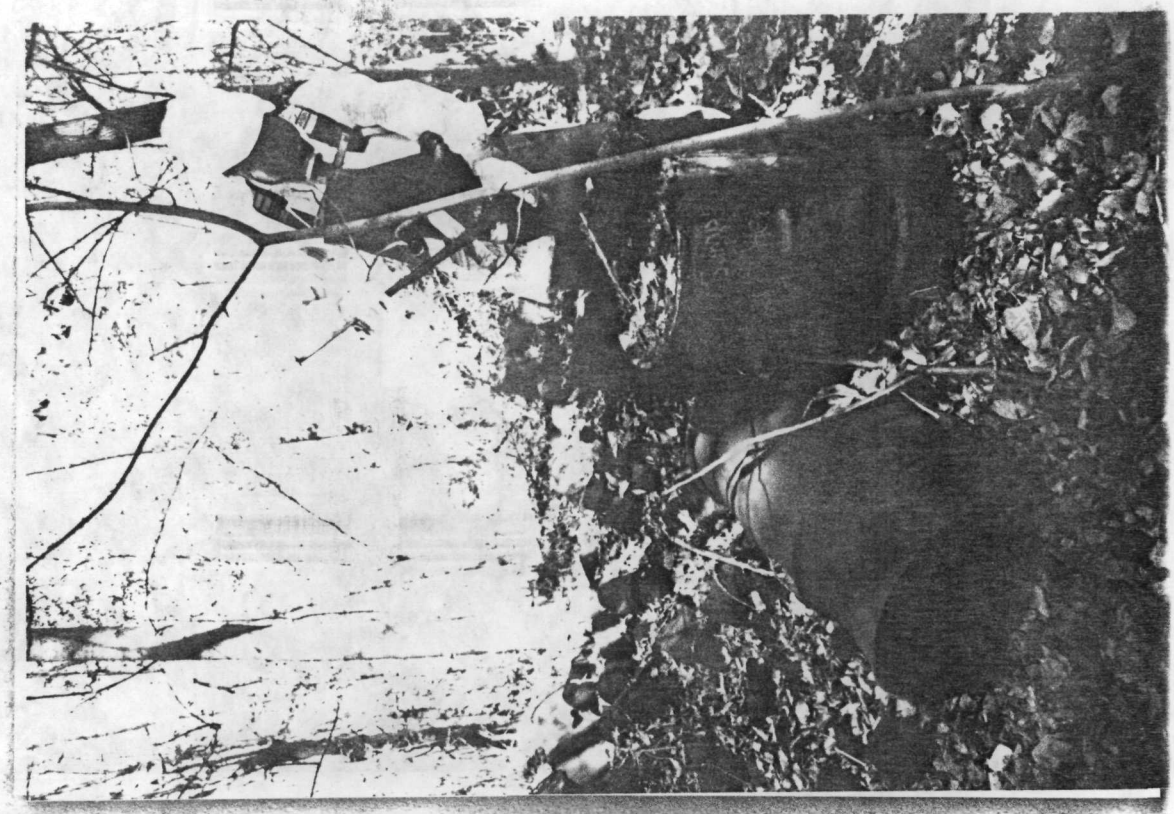
Site: JACKSON DROP FORGE
Photo No: 39
Direction: SOUTH
Camera: MINOLTA
Photographer: DIECKHAUS

Date: OCTOBER 18, 1993
Subject: VIEW OF HOUSE NOTE THE PROXIMITY OF DRUMS TO THE HOUSE (THIS IS AREA OF SAMPLES JDF#s 1, 2, 3, & 8).



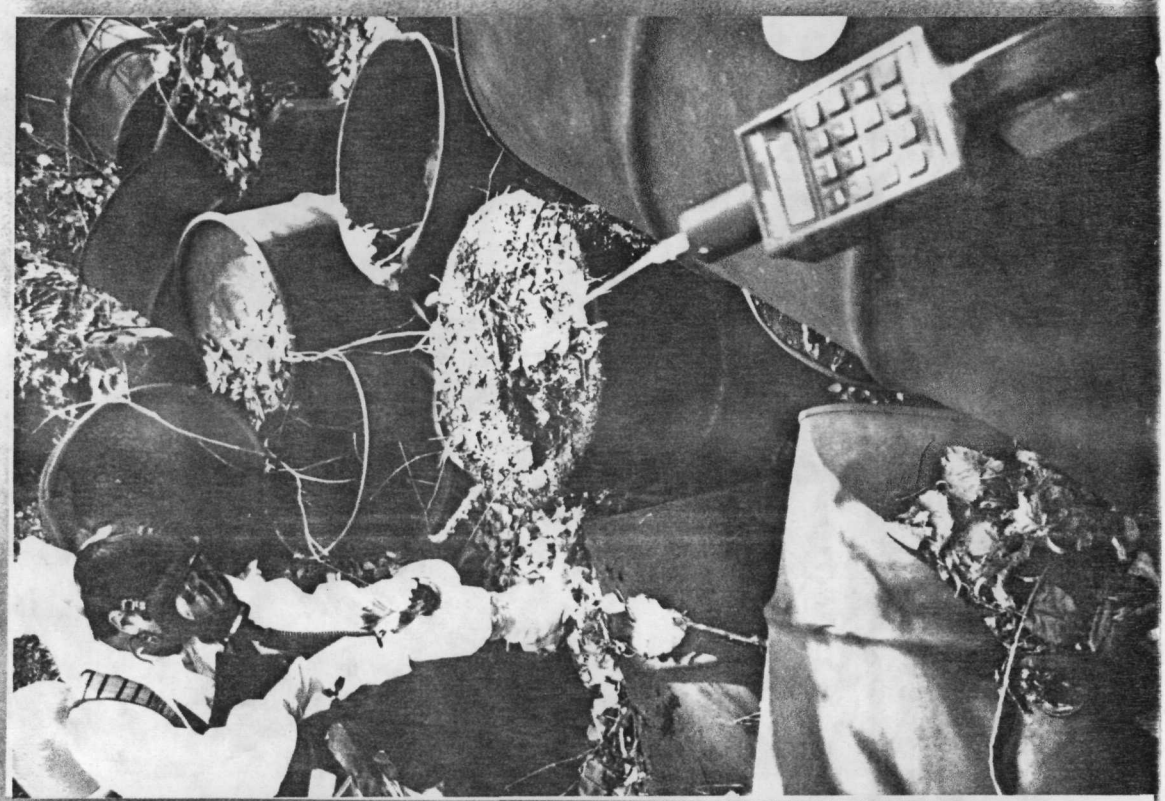
Site: JACKSON DROP FORGE
Photo No: 40
Direction: EAST
Camera: MINOLTA
Photographer: LANCASTER

Date: OCTOBER 25, 1993
Subject: SOIL SAMPLE JDF#1, COLLECTED ON RIDGE OF FILL MATERIAL ABOVE FLOOD PLAIN.



Site: JACKSON DROP FORGE
Photo No: 41
Direction: N/A
Camera: MINOLTA
Photographer: LANCASTER

Date: OCTOBER 25, 1993
Subject: TATM COLLECTING SAMPLE JDF#2, PID READING OF SAMPLE WAS 345 ppm.

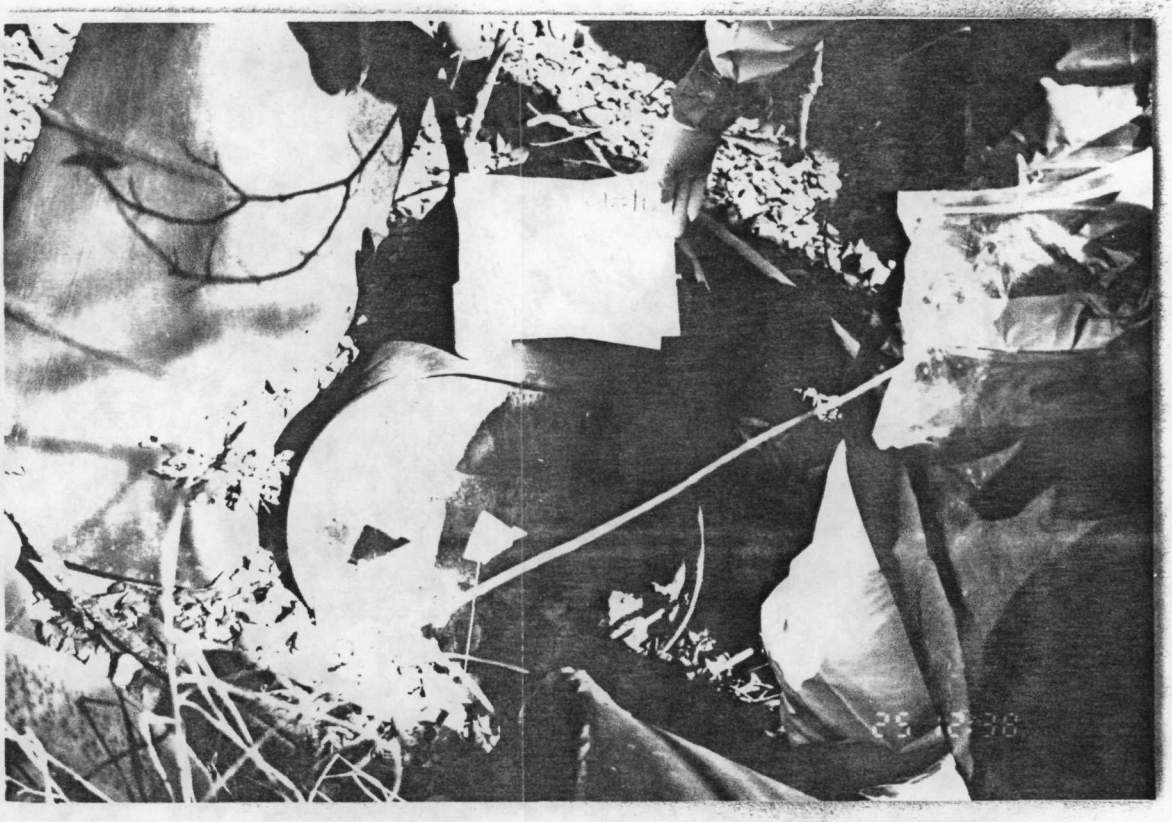


Site: JACKSON DROP FORGE
Photo No: 42
Direction: NORTH
Camera: MINOLTA
Photographer: LANCASTER

Date: OCTOBER 25, 1993
Subject: TATM COLLECTING SAMPLE JDF#3, THESE DRUMS ARE LOCATED BEHIND HOUSE ON WELLWORTH AVENUE.

Site: JACKSON DROP FORGE
Photo No: 43
Direction: NORTHWEST
Camera: MINOLTA
Photographer: LANCASTER

Date: OCTOBER 25, 1993
Subject: SOIL SAMPLE JDF#4 COLLECTED FROM A RIDGE MADE OF FILL.



Site: JACKSON DROP FORGE
Photo No: 44
Direction: NORTH
Camera: MINOLTA
Photographer: LANCASTER

Date: OCTOBER 25, 1993
Subject: SAMPLE JDF#5, A WHITE POWDER COLLECTED FROM THIS DRUM ON THE FLOOD PLAIN.

Site: JACKSON DROP FORGE
Photo No: 45
Direction: NORTH
Camera: MINOLTA
Photographer: LANCASTER

Date: OCTOBER 25, 1993
Subject: DRUM FROM WHICH TAT HAD PLANNED TO COLLECT SAMPLE, PRIOR TO RIVER OVERFLOWING ONTO FLOOD PLAIN.

Site: JACKSON DROP FORGE
Photo No: 46
Direction: NORTHWEST
Camera: MINOLTA
Photographer: LANCASTER

Date: OCTOBER 25, 1993
Subject: DRUM FROM WHICH SAMPLE JDF#6 WAS COLLECTED, PID READING INSIDE DRUM WAS 502 ppm.

Site: JACKSON DROP FORGE
Photo No: 47
Direction: N/A
Camera: MINOLTA
Photographer: LANCASTER

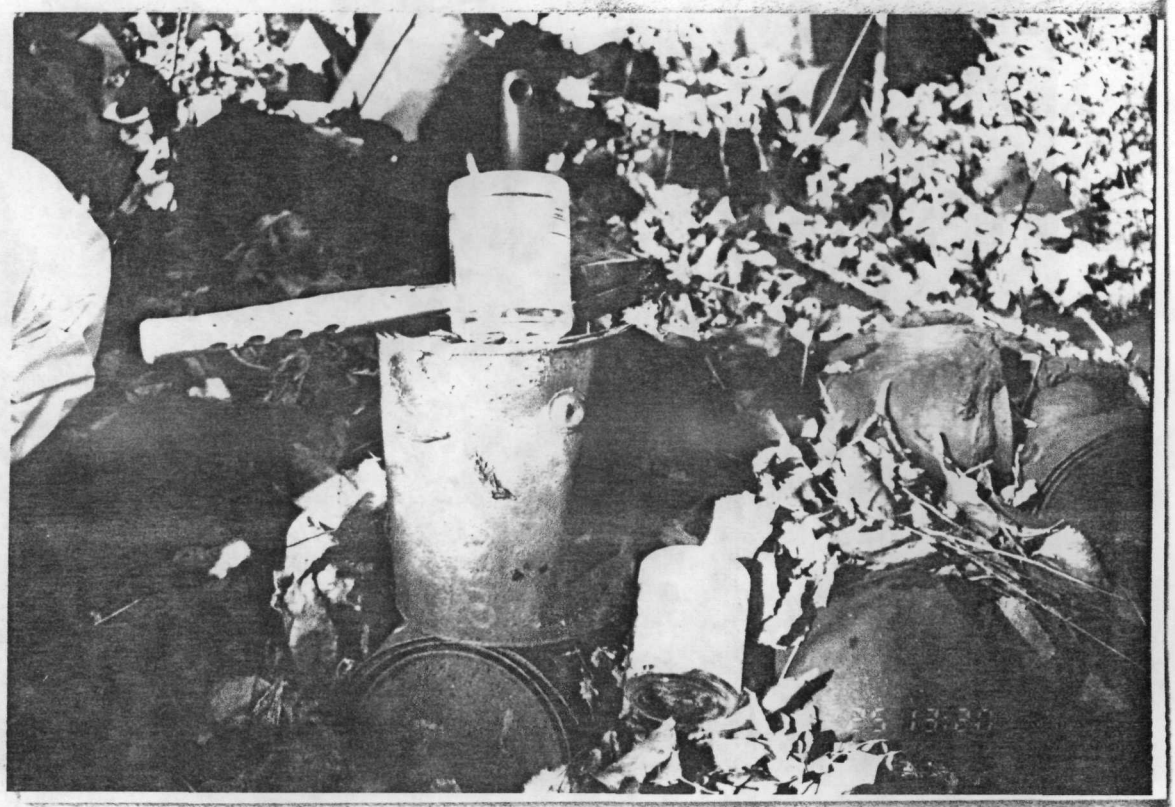
Date: OCTOBER 25, 1993
Subject: AREA WHERE SOIL SAMPLE JDF#7 WAS COLLECTED NEAR EASTERN EDGE OF SITE.

Site: JACKSON DROP FORGE
Photo No: 48
Direction: WEST
Camera: MINOLTA
Photographer: LANCASTER

Date: OCTOBER 25, 1993
Subject: VIEW OF DRUMS SCATTERED IN FLOOD PLAIN.

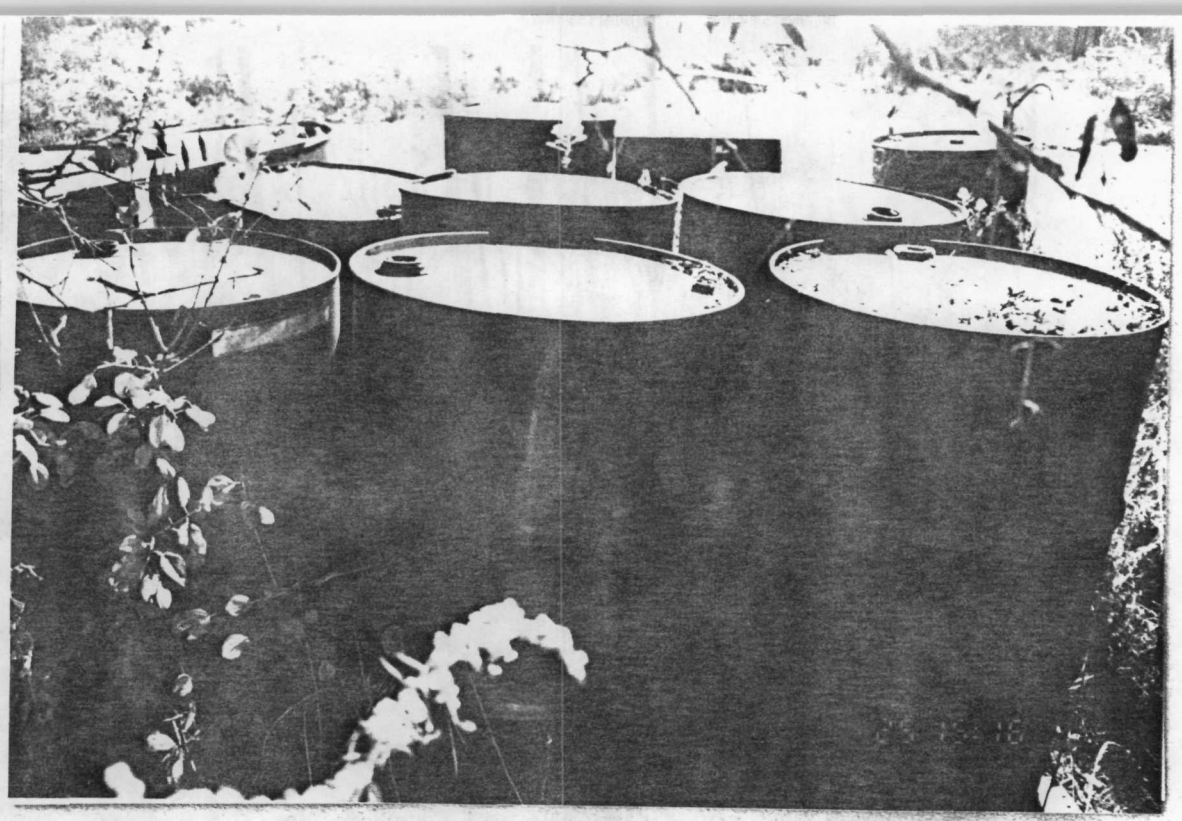
Site: JACKSON DROP FORGE
Photo No: 49
Direction: EAST
Camera: MINOLTA
Photographer: LANCASTER

Date: OCTOBER 25, 1993
Subject: VIEW OF DRUMS SCATTERED IN THE GRAND RIVER FLOOD PLAIN.



Site: JACKSON DROP FORGE
Photo No: 50
Direction: NORTH
Camera: MINOLTA
Photographer: LANCASTER

Date: OCTOBER 25, 1993
Subject: SAMPLE JDF#8 COLLECTED FROM THIS ONE GALLON PAINT CAN LOCATED BEHIND HOUSE ON WELLWORTH AVENUE.

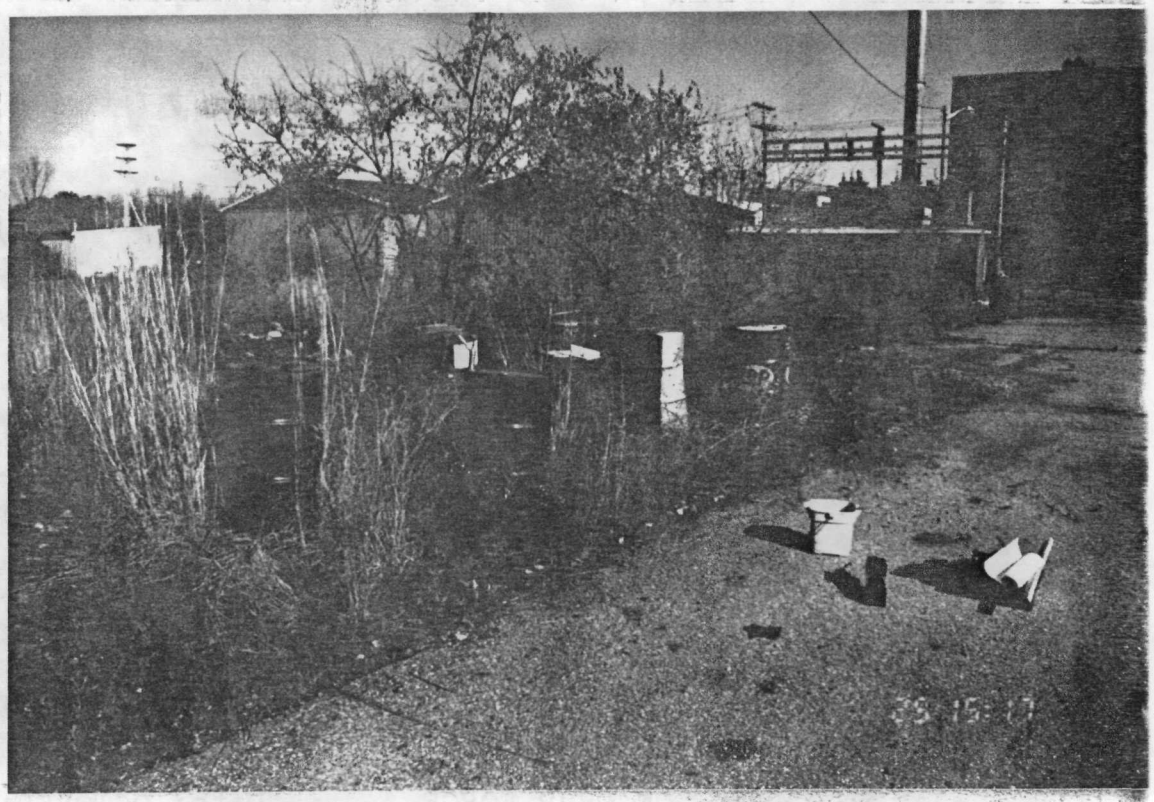


Site: JACKSON DROP FORGE
Photo No: 51
Direction: SOUTH
Camera: MINOLTA
Photographer: LANCASTER

Date: OCTOBER 25, 1993
Subject: 55-GALLON DRUM FROM WHICH SAMPLE JDF#9 WAS COLLECTED, PID READING INSIDE THIS DRUM WAS 160 ppm.

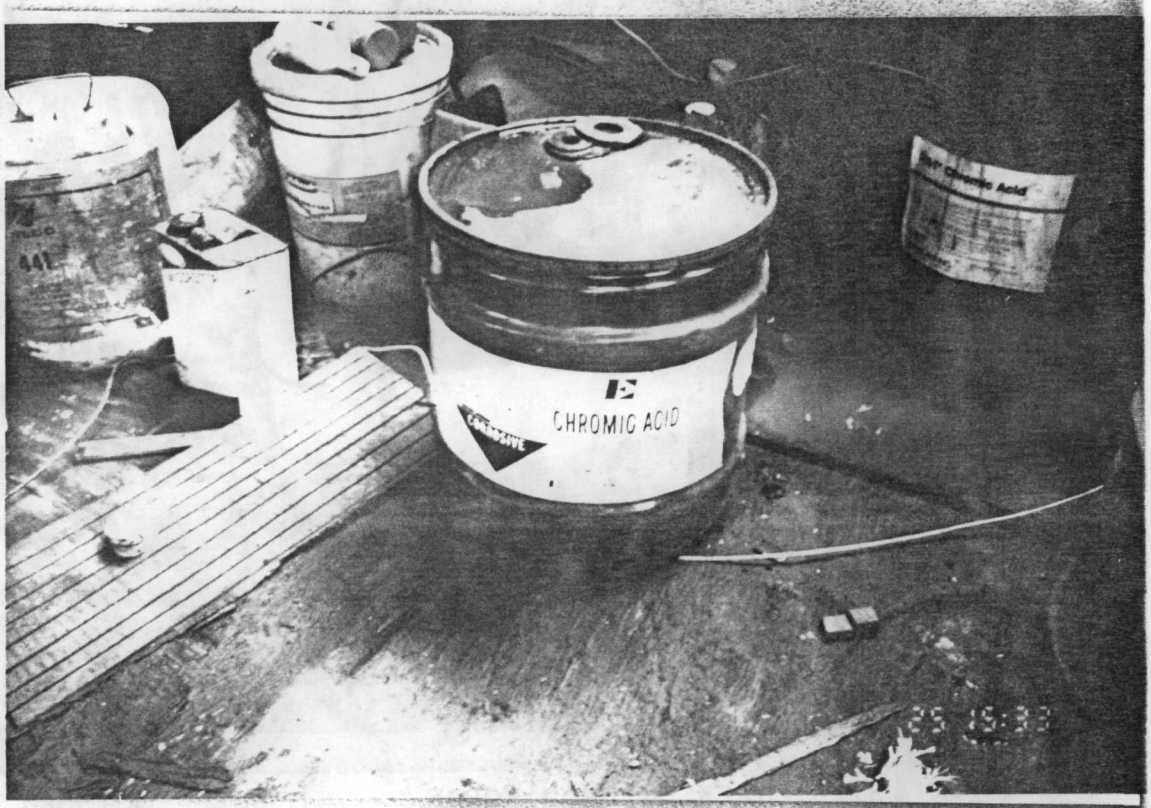
Site: JACKSON DROP FORGE
Photo No: 52
Direction: SOUTH
Camera: MINOLTA
Photographer: LANCASTER

Date: OCTOBER 25, 1993
Subject: NOTE OIL STAINED SOIL NEXT TO DRUMS SEEN IN PHOTO 53.



Site: JACKSON DROP FORGE
Photo No: 53
Direction: EAST
Camera: MINOLTA
Photographer: LANCASTER

Date: OCTOBER 25, 1993
Subject: AREA ON WEST SIDE OF JDF PROPERTY.

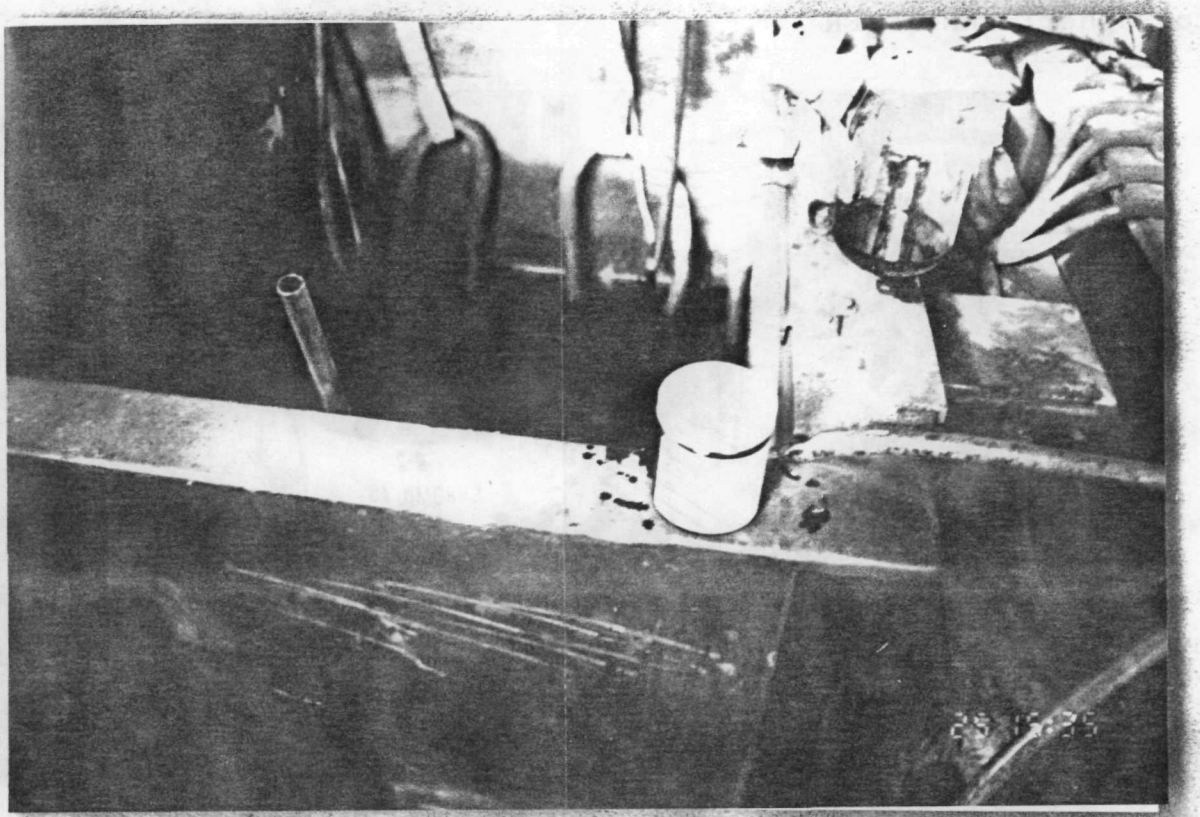


Site: JACKSON DROP FORGE
Photo No: 54
Direction: N/A
Camera: MINOLTA
Photographer: LANCASTER

Date: OCTOBER 25, 1993
Subject: 5-GALLON CONTAINERS OF CHROMIC ACID AND OTHER MATERIALS IN THE "PLATING HOUSE".

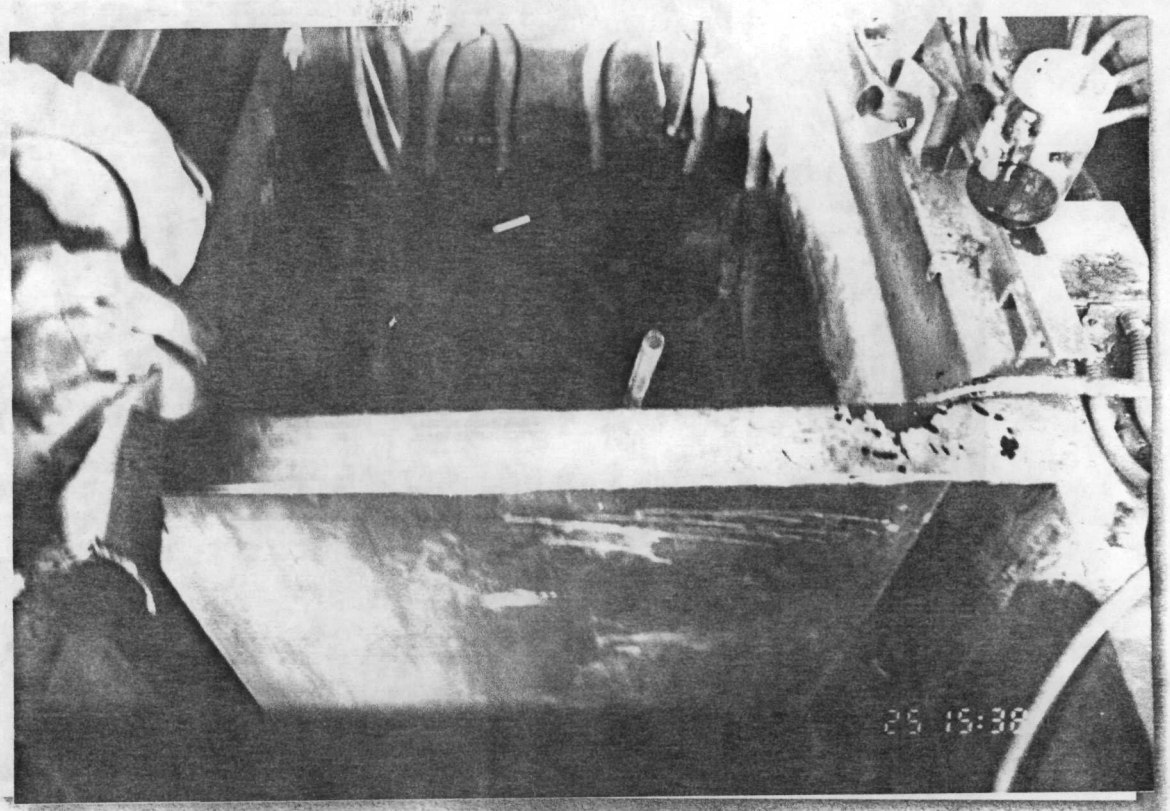
Site: JACKSON DROP FORGE
Photo No: 55
Direction: NORTH
Camera: MINOLTA
Photographer: LANCASTER

Date: OCTOBER 25, 1993
Subject: DRUMS AND CONTAINERS INSIDE "PLATING HOUSE" WHERE SAMPLE JDF#10 WAS COLLECTED.



Site: JACKSON DROP FORGE
Photo No: 56
Direction: N/A
Camera: MINOLTA
Photographer: LANCASTER

Date: OCTOBER 25, 1993
Subject: SAMPLE JDF#10 COLLECTED FROM PLATING VAT.



Site: JACKSON DROP FORGE
Photo No: 57
Direction: N/A
Camera: MINOLTA
Photographer: LANCASTER

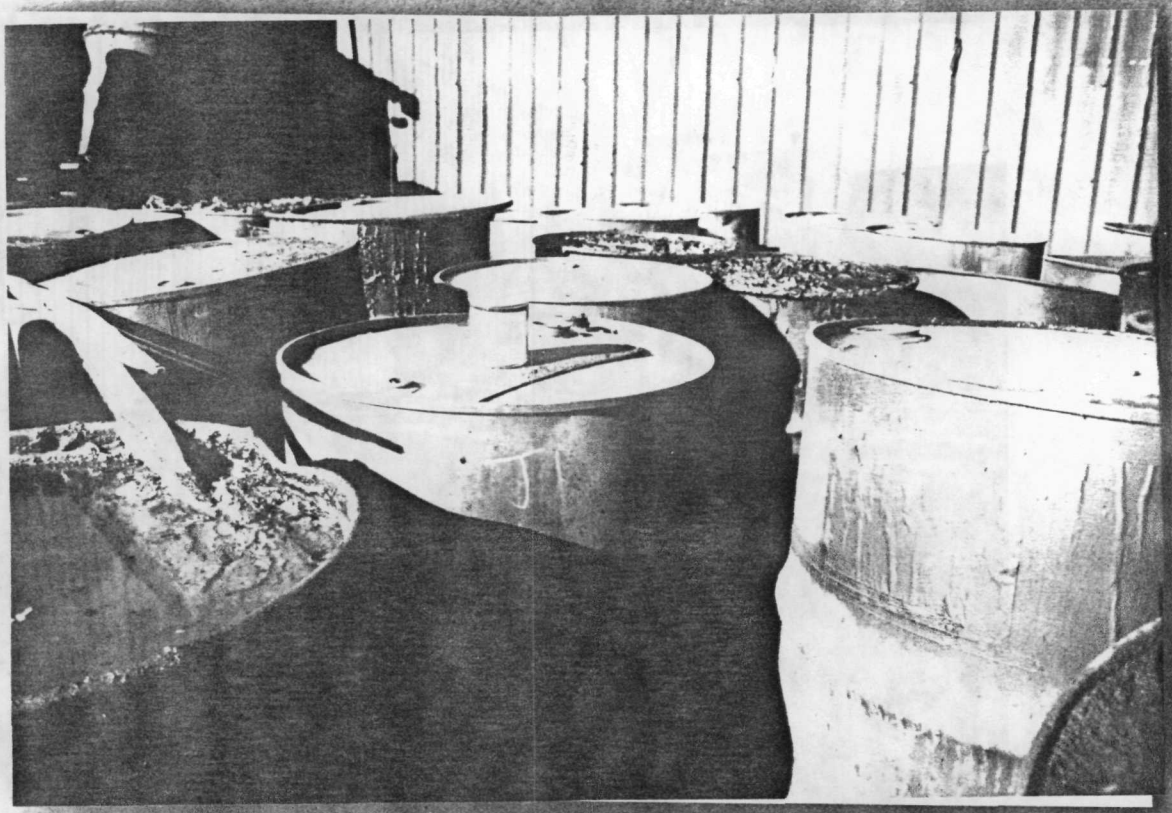
Date: OCTOBER 25, 1993
Subject: PLATING TANK FROM WHICH SAMPLE JDF#10 WAS COLLECTED.

Site: JACKSON DROP FORGE
Photo No: 58
Direction: WEST
Camera: MINOLTA
Photographer: LANCASTER

Date: OCTOBER 25, 1993
Subject: 55-GALLON DRUMS STACKED ON THE SOUTH SIDE OF JDF FACILITY, NOTE OIL STAINED CONCRETE.

Site: JACKSON DROP FORGE
Photo No: 59
Direction: WEST
Camera: MINOLTA
Photographer: LANCASTER

Date: OCTOBER 25, 1993
Subject: 55-GALLON DRUMS STACKED ON SOUTH SIDE OF FACILITY, NOTE OIL MIGRATING OFF PROPERTY.



Site: JACKSON DROP FORGE
Photo No: 60
Direction: NORTHWEST
Camera: MINOLTA
Photographer: LANCASTER

Date: OCTOBER 25, 1993
Subject: SAMPLE JDF#11 COLLECTED FROM DRUMS STACKED ON SOUTH SIDE OF FACILITY (SEE PHOTOS 58 & 59).